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OR
HEALTH HINTS.



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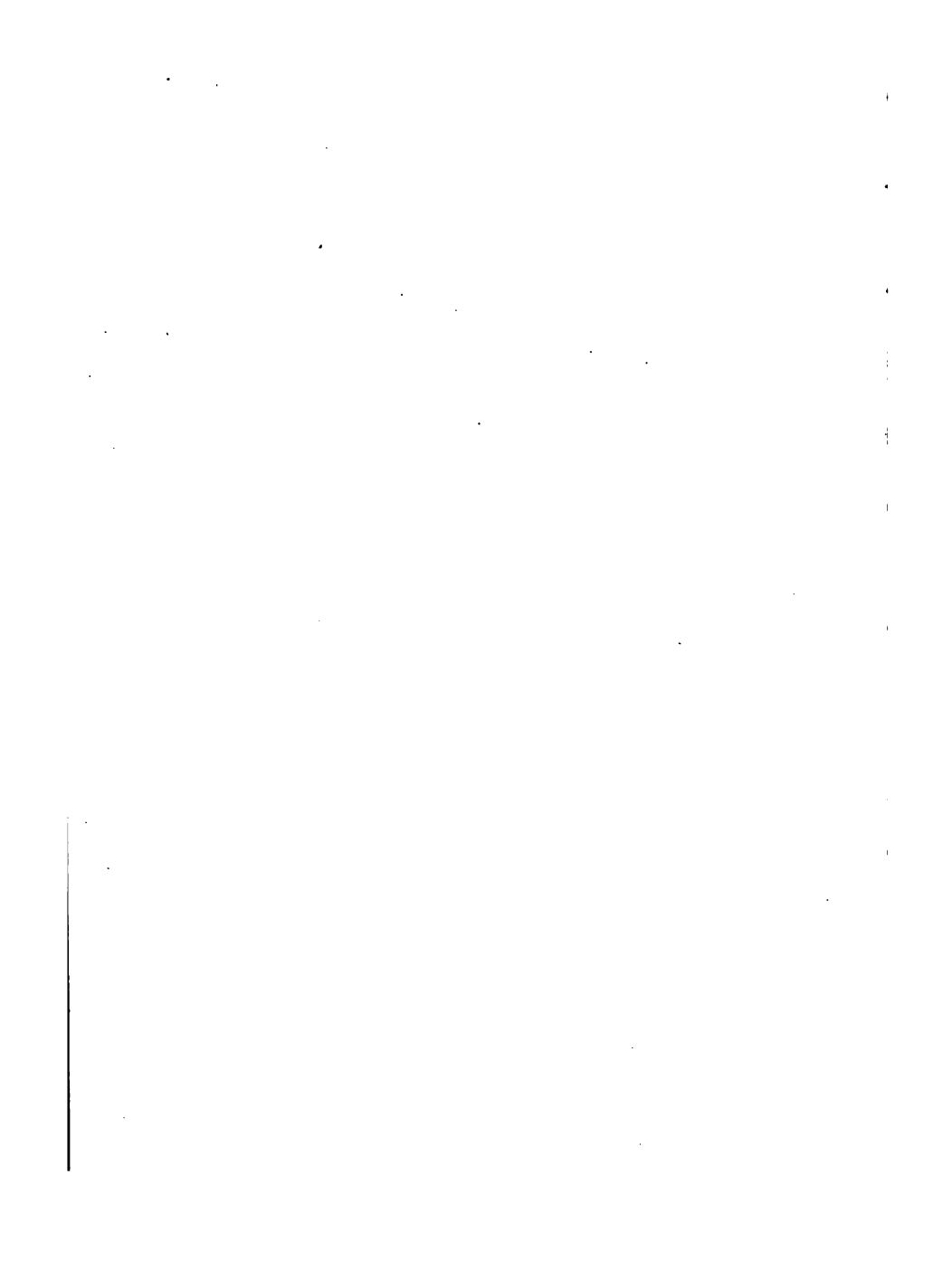


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PREFACE.

THIS volume, written mainly for the public, has a threefold purpose.

First: to impart in a popular, easily understood, and condensed form, the elements of the all-important study of Hygiene, or the art of health-preservation; doubtless destined to be the chief element in the medicine of the future.

Second: to show how numerous, varied, and important are the health-hints contained in that most ancient of all authorities—the Bible.

Third: To prove that the secondary trendings of modern philosophy run in a parallel direction with the primary light of the Bible; and to point out the indirect

evidence thus derived from an unexpected quarter, namely, these far-seeing sanitary maxims, and the medical science of the Scriptures generally, in proof of the inspiration and credibility of Holy Writ.

The principal source of information has necessarily been the Sacred Book itself, of various editions, annotated and otherwise ; to which Cruden's well-known Concordance has proved an indispensable key. The admirable hygienic handbooks of Parkes and Wilson ; the physiological writings of Carpenter and other recognized authorities ; are also quoted or alluded to when necessary, especially to show where they are corroborated and established by the medical conclusions of Scripture.

August 1878.

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CHAPTER I.

THE BIBLE AS A SOURCE OF GENERAL INFORMATION.

ONE of the main articles in the Christian faith is the belief that the Almighty has not left mankind in complete doubt regarding themselves, the creation of which they form part, and the great Being whom they worship and regard as their Maker, but has given a double—namely, a *written* and an *unwritten*—revelation; that is, His *Word* and His *works*; the former being the book called the Bible, and the latter the vast and more abstruse volume of Nature.

Of these, the former tells us chiefly about the Author of all things; while the latter, interpreted by science, explains His handiwork. They differ in one essential feature—that while the facts of Nature are often mysterious and easily misunderstood, the truths of the more important of the two are given in comprehensible human language. Yet,

though individually distinct, the Word of God and the book of Nature conjointly form one great whole, each being the key-note and the complement of the other. Nor is it possible that they can materially disagree, seeing that the one was inspired, and the other made, by Jehovah. True, Religionists, instead of aiding, have not unfrequently opposed and retarded the advance of science, and Scientists the progress of religion. But veritable religion—that is, the worship of the Deity—and veritable science—that is, the faultless story of His works—can never conflict. And doubtless when mistranslations of Scripture are corrected, and science is made more accurate; when theologians are better versed in science and philosophers in Scripture; and when investigators of both classes become more liberal and less dogmatic, it will be found that those facts alone are genuine, and that science alone true, which agree with Scripture. Fancied discrepancies will then disappear, apparent enigmas will be solved, and the close correspondence between the written text of the Bible and the unpenned record of Nature fully recognized. In other words, it will be found that science and revelation are not antagonistic and contradictory, but mutually dependent and corroborative;

and both necessary to make the invaluable inheritance perfect. And, though doubters have questioned and disbelievers denied the inspiration and credibility of Scripture, and attacked the Bible on the score of its Prophecies, History, Chronology, Language, Literature, Miracles, and so forth ; so doubtless the more recent attempts to throw discredit on its pages from the side of science will ultimately prove equally futile.

The human race is much indebted in various ways to the sacred Book. It informs us mainly about God's relation to man, and man's to Him. Without it we should be a puzzle to ourselves, and the deity a still greater mystery ; while of our origin, place in nature, history, destiny, and those of the world fashioned expressly for us, we should know next to nothing. Even the universally prevalent and clearly intuitive belief in the existence of a supreme Being and of a future state would be vague and unconfirmed. Without the information so imparted, how tame, worthless, and uninteresting would the present life be, and how hopeless the future !

But although mainly a complete and superb moral and spiritual treatise, the Bible is a great literature in small bulk, and wonderful compendium, replete

with valuable information on many subjects, incidentally imparted, much of which we could obtain nowhere else, and in which new beauties and excellencies are being constantly discovered.

Thus, to cite only a few of its merits, where could Christians of every age and condition find a better directory for soul-elevating, heart-gladdening communion with God, beautiful truths far above this world's wisdom, and such a wonderfully accurate and veracious analysis of the workings, joys, and sorrows of the human heart, or a truer synopsis of personal religious experience, than in the Psalms? while in the Lord's Prayer we have a more comprehensive, devout, and epitomized petition than any uninspired mortal could pen. Nor could the most gifted human philosopher compile a system of social and moral ethics so complete and yet condensed as the Ten Commandments, and the two fundamental principles into which they were subsequently curtailed (Matt. xxii. 30-40), thereby furnishing the base-work of the noblest personal, social, and political morality in the world. And, again, it would be impossible to give a more perfect code of rules than those plain and simple maxims scattered through the Bible to tell us how we may individually

and collectively attain the highest happiness in this probationary state of existence, and the unalloyed bliss of the future life.

To say nothing of the literary excellence of the Scriptures throughout, where is the uninspired poetry that can equal that of the Psalms, Job, Proverbs, Ecclesiastes, Song of Solomon, Isaiah, and most of the Prophets, for pathos, sublimity, beauty, animation, force, and expressiveness? Or where can those who strive to make the best of both worlds find a better guide through life, and a more complete code of sagacious, practical sayings, moral precepts, and religious teachings than in Proverbs and Ecclesiastes? a collection that stands above every other mass of wisdom that the ingenuity of man has ever brought together, each being a gem, and the whole a mine, in which many a sage has founded a reputation; and of which it has been well remarked, that had they come from Greece instead of Judea, and no mention been made of the God of truth and love, the wise men of this world would never have ceased to extol them and glorify their Author.

So, in like manner, illustrations might be given of the Law and Art, the History and the Biography of the Scriptures, the latter two being curt, com-

prehensive, suggestive, searching, and for the most part the only reliable record of primeval times. But it is chiefly to the science of the Bible that we wish to call attention meanwhile. Not only are the elementary or base facts of most of the great sciences given, including some of comparatively recent development, but important modern theories and discoveries are not unfrequently foreshadowed in a manner that stamps the Book as a no less profound and accurate than ancient scientific authority ; and showing that the philosophy of the Bible only required modern enlightenment and research to decipher and illustrate it.

For example, the science of Ethnology is outlined. Modern science, in demonstrating the unity of the many different races of man, as deduced by anatomical, physiological, and psychological research, has only confirmed the dictum long since laid down by Scripture, that "God hath made of one blood all nations of men for to dwell on all the face of the earth" (Acts xvii. 26). And, again, while modern anthropologists have divided the genus *Homo* into three great varieties—Mongolian, Ethiopian, and Caucasian—we have to turn to early Bible history to find their conclusions anticipated and corroborated, and to have their system

completed by tracing the genealogical descent of these from the three sons of Noah,—namely, Shem, Ham, and Japhet, respectively.

So also the elements of Zoology exist ; for in Genesis we have the first division of animals into beasts of the field, fowls of the air, fish of the sea, and reptiles or creeping things (Gen. ii. 19, 20) ; while again in the record of the Flood (Gen. vii. 2 ; viii. 20), and subsequently in the lists of edible and non-edible varieties of food given in the Pentateuch (Lev. xi. ; Deut. xiv.), we have animals classed into clean and unclean (chap. iv.), quadrupeds which are cud-chewers and cloven-hoofed or foot-parted being singled out from such as are not, and from those which go on their paws, a list which includes predatory beasts. The non-edible predatory birds are grouped apart from the clean or edible domesticated varieties or vegetable feeders. Fish that have neither fins nor scales are classed apart from such as have both. Creeping animals are distinguished, such as the lizard, serpent, and tortoise ; also centipedes, and similar many-footed insects, which both fly and leap ; and lastly, flying insects with leaping legs. Solomon, like Adam and Moses, was evidently a naturalist, for he spake of beasts, fowls, creeping

things and fishes (1 Kings iv. 33). And it is worthy of note that our present zoological arrangements do not differ materially from, but are mainly little else than elaborations of, these primary and ancient classifications.

Again, in Genesis we find the first arrangement of the vegetable world, namely into grasses, herbs, trees, and fruit trees. Solomon was a botanist, for he spoke of trees and plants, from the huge cedar to the small hyssop on the wall (1 Kings iv. 33). The first in modern time to devise a thorough arrangement of plants was Linnæus during last century. This was based mainly on the reproductive organs. But even its author was satisfied that this so-called "artificial" system was imperfect, and wished for a better. Nor was this supplied till the present century, when De Candolle gave us what he termed the "natural" system, which classes plants according to their essential organs, the growth of the stem, and the number of seed leaves. How strange to find that this truer, though more abstruse and difficult arrangement had been clearly outlined for ages in the Mosaic record of the Creation (Gen. i. 11, 12), in which the nature of the seed, fruit, leaf, and the size and character of the plant, are the recognised

distinctions. The part which the leaves perform in the construction of the trunk of the tree is supposed to be quite modern. Yet is it not foreshadowed, and the physiology of exogenesis thus truthfully taught, by one of the greatest Prophets, in the passage "As a teil tree or as an oak whose substance is in them when they cast their leaves" (Isa. vi. 13)?

But, besides the above illustrations drawn from animate nature, the Bible is also replete with others taken from the phenomena of inanimate creation. Long before Galileo suffered for science in endeavouring to refute a long held and fondly cherished but erroneous public opinion, the great base fact of astronomy was suggested in the pithy Bible query, "Who hath meted out the heavens with a span?" (Isa. xli. 12.) And in a subsequent page the question is thus answered, "The Lord hath stretched out the heavens by His discretion" (Jer. x. 12). Nor was it till comparatively recent times that mankind arrived at a similar conclusion, and discovered that the hosts of heaven and its innumerable stars, asteroids, planets, and comets, of all degrees of size, distance, and importance, are not scattered at random over the immensities of space, but have each their own special place

and definite orbit; the intermediate distances being so accurately measured that not one attracts another so as to permanently draw it out of place or seriously disturb its movements. Again, other passages of Scripture, as, for example, "God appointed the moon for seasons" (Psalm civ. 18); and again, "The sun knoweth his going down" (Psalm civ. 19), clearly indicate the regularity, periodicity, and definiteness of purpose in the physical arrangements of nature. Moreover, we find the possibility of star classification, a study only yet in progress, distinctly pointed out in the text "He bringeth out their host by number. He calleth them all by names; not one faileth" (Isa. xl. 26). Some of the more prominent constellations are also singled out, as for example, the Pleiades, Orion, Arcturus or the Great Bear, the "Chambers of the South," or southern star groups (Job. ix. 9), and also Mazzaroth, ~~or~~^{and} the twelve signs of the Zodiac (Job. xxxviii. 32).

But the most striking of all the Scriptural allusions are the geological. The great base facts of this science were outlined and the grand creative act broadly given in strictly accurate chronological sequence long ere the days of Smith, the "father of geology," and ages before this nineteenth cen-

tury science was even thought of. And recent discoveries of facts deciphered from the great and mysterious stone-book of nature, especially within the present century, instead of contradicting the Mosaic record as once supposed, are being found to agree closely with it. In the masterly epitome found in the first chapter of Genesis, we read, first, of the immeasurably distant period when God made "the heavens;" then of the much later "beginning," when He commenced and "laid the corner-stone" of our world (Job xxxviii. 6), to commemorate which "the morning stars sang together and all the sons of God shouted for joy" (Job xxxviii. 7). And then of the long geological days, so different from our puny periods of time, during which cosmos was slowly developed from chaos, and the vast operations by which plants, animals, fishes, and all the beautiful and variegated animate and inanimate surface furniture of nature, including man, its crowning masterpiece, were evolved. And then of the long seventh day, the earthly Sabbath of the Supreme, during which He has stayed His creative hand and rested from His labours. Again, when the Apostle Peter, a humble non-philosophic fisherman, foretold the earth's destiny thus: "The day of the Lord will

come as a thief in the night, in which the heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up" (2 Peter iii. 10), his prophecy clearly anticipated by nearly 2000 years the deductions of modern physicists, including some who deny the inspiration of Scripture, but who, nevertheless, in their studies regarding the probable end of the world, unconsciously prove the remarkable coincidence that exists between the statements of the Bible and the conclusions of science, when they tell us that the earth was at one time a globe of fire and is likely to have a fiery end, inasmuch as all planetary matter is tending toward the sun in a series of spirals, so that every planet and meteor belonging to the solar system is slowly but surely creeping toward, and must, in turn, fall into that luminary, the heat and light of which are due to this constant gravitation and addition of fresh material, with which our earth must necessarily be in turn incorporated.

The colossal chemistry of creation is likewise beautifully illustrated when the Bible tells us that God "hath measured the waters in the hollow of His hand; weighed the mountains in scales,

and the hills in a balance " (Isa. xl. 12). Nor was it till Dalton, a chemist of last century, illustrated the law of combination of liquids and gases by volume, and of solids by atomic proportions, that this mysterious but sublime sentence, once deemed an exaggerated hyperbole, or flight of the imagination, was discovered to constitute a great scientific fact, no less accurately than poetically expressed. The two gases that form the main element in water, and the different solids of which the earth is composed, are united in the same definite proportions, no matter what their bulk may be. A drop of water shows the same relative quantities of hydrogen and oxygen as the mighty ocean ; and a hand specimen of rock the same proportionate elements as the "everlasting hills."

Again, ages before the study of the law of storms was begun—a matter of comparatively recent date—the God of Nature had indirectly penned a synopsis of the fundamental facts of meteorological science ; and with this our human theories are found to closely correspond. Modern research has only proved what Scripture long ago pointed out, viz., that "the wind goeth round the south and again unto the north ; it whirleth about continually, and the wind returneth again

according to his circuits" (Eccles. i. 6). The many different varieties of wind that prevail in different parts of the globe, whether monsoon, trade, cyclonal, and variable, do not come and go by chance, as once supposed; but everywhere blow according to laws still imperfectly elucidated, but not the less certain and definite. So also the sacred text clearly explains the physical geography of the waters that cover the globe; and long ere Maury's invaluable pioneer researches, we had the phenomena of rain, river, and ocean circulation given (Eccles. i. 7); and also the explanation of what was once a puzzle, namely, why the sea never overflows by the constant addition of rain and river water: "All the rivers run into the sea, yet the sea is not full. Unto the place whence the rivers came (the mountains) thither they return again" (Nahum i. 3, 6), by evaporation and subsequent deposition as clouds, mist, and rain; for "He causeth the vapours to ascend from the ends of the earth" (Jer. x. 13), to make earth-fertilizing rain; and "He watereth the hills from His chambers" (Psalm civ. 13) to form commerce-favouring rivers.

Various other meteorological and physical phenomena — for example, thunder, lightning,

light, heat, volcanic and earthquake action, and so forth—are also spoken of in Scripture ; while many important facts and puzzling questions are also given, so that modern philosophers may yet find some abstruse problems in its pages ; and notably those asked by Jehovah (Job xxxviii., xxxix., xl., and xli.)

And as with other sciences, so it is with those which deal specially with the human frame. From the Bible alone we learn that the human race was once as free from pain, disease, and death, as from sin and sorrow ; and that man was originally meant to inherit not only spiritual, but also either physical immortality or the faculty of making a painless transition from earth to heaven. It tells us that these two evils resulted from the same cause, and were simultaneously introduced ; and points out the close analogy between the origin, cause, cure, and prevention of the spiritual and the physical maladies to which mankind is now liable. The sacred text gives the history of man's brief career in Eden ; the happy physiological era, when pain, disease, and death were unknown, except among the "beasts that perish." And then it tells of the early deprivation of this great boon, and of the inauguration of the less joyous patho-

logical period in which we now live, during which these evils have been rampant. Fortunately it also informs us how they are best and longest avoided; and how the nearest approach to the former state of perfect immunity may be attained. In short, the Scriptures likewise contain all the elements of etiology, that is, the philosophy of disease causation; while the still more important subject of hygiene, or health-preservation, is likewise plainly given.

The Bible may appear a strange source in which to seek for information of this kind; a curious mine in which to dig for health-hints. But mature reflection will convince the candid inquirer that if this Book is of Divine origin, it is the most natural to which we could resort, and not more likely to contain laws for the care of the invisible, yet most important part of our being, than for the perishable casket in which God has seen fit for a time to enshrine it; while examination will show that as an authority on health matters, it is not only ample, accurate, and profound, but without a parallel in the writings and sayings of the great saints and sages of antiquity.

The variety, depth, and accuracy of the scientific quotations from Scripture already adduced, are re-

markable. And it may be naturally asked whence did these thirty-five, or at most thirty-eight, Bible authors, of different races and classes,—shepherds, fishermen, poets, warriors, statesmen, kings, mostly illiterate, and all, with one exception, non-professional, derive their philosophical knowledge, at a period when science was comparatively speaking in its infancy? And how can we account for their non-contradiction of each other, although they could not be in collusion, for they wrote in different places and countries, and lived in different parts of an era extending over 1,500 years, long intervals generally elapsing between their individual utterances; although, amid many diversities of manner, thought, form, and style, the superintendence of one pervading mind is evident throughout? Yet it is against the domain of Scripture science that modern scepticism has mainly directed its arguments to invalidate the accuracy, credibility, and inspiration of Scripture.

One science, however, has not yet been drawn into the controversy. And it seems worthy of investigation whether or not the medical philosophy of the Bible, especially its erudite and practical *health hints*, are such as to increase or lessen our belief in the inspiration and trustworthiness of

Holy Writ. To accomplish this it will be necessary to examine their source, and enter briefly into the early history of medicine; basing our remarks mainly on Moses, the chief biblical medical authority; and on his far-seeing and able hygienic laws for the guidance of the Israelites in the wilderness, that constitute, especially those on public sanitation, the most important in the Scriptural collection.

As the adopted son of Pharaoh's daughter (Exod. ii. 10), and resident at Court, Moses, like other princes, was specially educated by the priests, the custodians of knowledge, that of medicine included; who jealously guarded and transmitted it only or chiefly in priestly channels; but who nevertheless made their special pupil "learned in all the wisdom of the Egyptians," at that time proverbial (Acts i. 22). From them he became versed in the literature, philosophy, law, painting, religion, history, and general knowledge of that day; and among other things with medical science. In short he was suitably educated as a scholar, warrior, and prince of high station. At that period there were no lay physicians; nor do we read of them till the time of Solomon; that is till about B.C. 1100. Moses, who wrote so well and

learnedly on medical matters, was not even a priest-physician, one of those ecclesiastics who devoted themselves specially to the study or practice of medicine. Medical science was only one, and that not the most attractive or important of his numerous studies. And to this science, moreover, we have no evidence that his rank and station either induced or compelled him to give more than the ordinary attention of a general scholar ; although a heaven-born impulse may, unknown to himself, have secretly urged him to this, in view of future usefulness. But of what nature was the medical science of that day ; and what the kind of instruction he could receive from the Egyptian priests, or glean for himself by private study and original research ?

Egypt was then the instructress of the world, the cradle of science, and source from whence the nations, not only of that, but of a later day, derived their erudition and philosophic inspiration. Even then, general knowledge was not in a very rudimentary state, since Egypt was comparatively civilized 230 years before Jacob's death. Certain of the arts and sciences had become wonderfully perfect, from long experience and centuries of observation. Agriculture, geometry,

architecture, metallurgy, had made remarkable progress, as the gigantic cities and monuments of that day prove. But from Renouard's History of Medicine we learn that it was very different with medical knowledge. This was of the most primitive and elementary kind, as was the information regarding the human body, of the internal structure of which, and its workings, they were very ignorant; mainly because prejudice, superstition, and distaste caused the basis of all medical matters, namely anatomy, to be unstudied till more than a thousand years later.

It was *then* what has been termed the "primitive" age of medicine, and era of the foundation or infancy of the healing art. The extent of its development we glean from the "Hermetic Code," consisting of forty-two volumes, in which all the knowledge of the savans of ancient Egypt was collected. Of this, the last six volumes related to medicine, and embraced a complete and well-arranged body of medical matter, treating of remedies, operations, diseases of the eye, diseases of women, and so forth. These essays prove that, their acquaintance with many branches of the art, particularly symptomatology, was wonderfully perfect. But the subject of hygiene is

conspicuously absent; thus proving that this department of medical philosophy was still little, if at all known.

In the midst of this prevalence of absurd theories, an illogical and uncertain practice, and general ignorance of hygienic matters, a Hebrew sage suddenly appears, and changes the entire aspect of medical science. He originates an entirely new system of theory and practice, completely subversive of, and indeed totally opposed to, the prevailing plans. He departs widely from the undeviating usage—that of therapeutical or curative medicine—followed not only by the Egyptians and other nations of antiquity, but by others of a much later day; and substitutes for it the more philosophic and wiser hygienic or preventive method. He gives to the world a health-code without a tinge of the absurdities of necromancy, superstition, and astrology, then so prevalent; containing no extraneous matter, wordy digressions, or side issues, so common in most ancient, and even in many much later compilations; and embraces rules that “collectively form one of the most precious and authentic monuments of the history of the healing art,” a code in which everything concerning health is regulated with great care;

and the laws, especially the well-defined, condensed, and pointed epitome for *the prevention, arrest, and ultimate stamping out of that class of ailments, which have most afflicted mankind in all ages, namely, contagious diseases*, are so perspicacious, curt, yet ample ; practical, yet logical ; far-seeing and efficacious, as to compare favourably with, and even surpass—not only in literary merit, but in a strictly medical point of view—the hygienic rules in vogue at the present day.

Whence did Moses, this pioneer student of hygiene, and the first to reduce it to a well-digested system, derive the information necessary to compile such a masterly summary of health laws ? And if it could not emanate from the Egyptian priests or any of their contemporaries or predecessors in Egypt or elsewhere, what was its source ? Was it purely or chiefly self-generated, or was it partly or mainly Heaven-sent and inspired ?

The idea of subsequent interpolation of the Bible text with these health laws in more enlightened times, as has been suggested with regard to other Scriptural illustrations of science, is one that cannot be entertained. Renouard tells us that even the Hippocratic Collection,—a thousand years after the supposed date of this Egyptian

encyclopædia, the Hermetic Code,—does not present so complete and methodical a system; proving that, thus far, hygiene had not progressed. Further on, during the “mystical” period of medicine,—that is, up to B.C. 500,—the science had still made little advance. A kind of physiological polygarchy prevailed, “man appearing to the early sages as a multiplied being, a little representation of the universe; his body being divided into many regions or departments, which were supposed to be governed by spirits of different orders,” which presided over and gave impulse to all the changes and anatomical phenomena which occurred, the custom in sickness being to interrogate the oracles, after fasting, prayer, and sacrifice. And although the practice of medicine, in the temples dedicated to the God of Medicine, was largely preventive—as it embraced diversion, air, regimen, hope, special curative medicines being also given—this after all was only the hygiene of disease, that is, curative hygiene. The hygiene of health, or preventive hygiene, for which Moses deserves so much credit, was apparently unstudied; otherwise it would have been recorded.

Still later, during what has been termed the

"Anatomical period" of medicine, which ended with the death of Galen, A.D. 200, we find that it was not till the rise of the Alexandrian school of medicine, in the year 320 B.C., that medical philosophy began to flourish, and that, popular prejudice having at length given way, Ptolemy Soter was enabled, in the year 300 B.C., to permit the opening of dead bodies to discover the causes of disease. The latter innovation soon brought anatomy, comparatively speaking, to high perfection, and necessarily caused the curative art to make rapid progress. But with preventive medicine it was very different, as we glean from the writings of Celsus, to whom during this era we are indebted for the most accredited hygienic precepts of his time. Even that celebrated physician, with the exception of making his rules more orderly and precise, added little to the writings of the Hippocratic collection already spoken of; while his hints were chiefly of a personal and not of a public nature, like the far more important ones given by Moses.

Descending the stream of time, and coming to the middle ages, we find that of all the medical sciences, hygiene, next to anatomy, was the latest cultivated. Governments were too much occupied

in maintaining and extending their dominions, and rarely inquired into what concerned public health; while private hygiene was equally stationary; so that for several ages the "Regimen Sanitatis Salernitatum," or maxims of the school of Salerno, chiefly of a dietetic nature, was the only hygienic code in vogue.

The daylight of science for a time went down with the decline of the Saracenic school of medicine in the thirteenth century, and an intellectual darkness prevailed for three hundred years. And although on the revival of letters the attention of physicians was early turned to the means of health-preservation and disease-prevention—that is, to hygiene—at first they only copied the teachings of the ancients. The earliest original writings of this age,—those of Cornaro, Lessing, and Mercurialis,—during the second half of the fifteenth century, added nothing new, and merely contributed to the restoration of hygiene. And, therefore, even up to this comparatively recent period of the world's history, who of all the medical authors extant could have constructed or interpolated such an admirable health code as that of the Israelites?

Since the last-mentioned era, so slow has been

the progress of hygiene, that it is only within the present age that it has been systematically studied, and so perfected as to assume the dignity of a science. But, singularly enough, till a comparatively recent period, the incomparable work of Moses appears to have been ignored or contemned by the medical authorities of all ages, countries, and creeds. Still, although the development of modern hygiene has followed the same direction,—while the results of human experience, reached by tardy steps and a totally different process, namely, by long-continued observation and experiment, are found to be *very similar* to the mainly theoretical though oracular conclusions of the Israelite,—it cannot be denied that neither as a science nor as an art has sanitation yet attained, practically at least though not perhaps theoretically, the perfection it had reached in the days of Moses. Indeed, contrasted with the teachings of modern times, the comprehensiveness and sufficiency of the rules comprised in the Hebrew code are so remarkable, as to be comparable to, if they do not surpass, both in literary and professional excellence, extracts from the best modern works on hygiene; so that savans may still sit with advantage at the feet of the Jewish sage, and learn, not only the great base facts, but even

many of the less important minutiae of the art and science which they study.

Non-Biblical hygiene is thus a modern science, and the idea of interpolation of the text of the Pentateuch with these sanitary laws in ancient, mediæval, or even in later times, falls to the ground. Nay, had a physician of the last, the beginning of the present century, or even of a later date, planned a sanitary code like this, he would have been immortalized, and deemed a leader of men,—a master-mind and giant intellect far in advance of his age. The work is therefore clearly that of Moses. Whence, therefore, did this Hebrew hygieist procure the information, or derive the acumen, to devise a system of public and private sanitation, so practical and complete ; and not only so much in advance of the medical science of his own day, but even in some respects so superior to that of modern times, that the light from this lofty beacon, beaming from amid the darkness of the past, not only serves to substantiate, but might even advance the knowledge of the present—if men would not continue to despise this authority because he is a Hebrew ; ignore his work because it is ancient and Asiatic ; and spurn instruction on a scientific subject because it is *biblical*. But, with the simpler study of rules that

have laid unused for centuries by the leading nations of the earth,—rules doubtless having a reversion to mankind at large through the chosen race to whom we owe, not only their preservation, but also abundant proof of their efficacy,—how is the *bonâ fide* advanced thinking of the great Jewish lawgiver to be accounted for? Is it of human or of Divine origin? Were these rules merely an accidental legacy bequeathed by ancient phenomenal talent, unaided *spiritually* any more than the Great Pyramid was *celestially*? Or, did God take such an interest in diseased and suffering humanity as to inspire Moses to write these extraordinary precepts found in Deuteronomy, and thus be the founder of public and private hygiene—unaccountable except as Isaiah xix. 19 *seems* to point to the Great Pyramid?

On *Moses'* preceptive teachings, however, there is indisputable evidence, from an unexpected source—long in opposition—of complete harmony existing between Scripture and Science; one example of non-refutation of Bible philosophy by recent research; and one illustration that may be confidently cited in proof of the veracity and inspiration of Holy Writ.

CHAPTER II.

THE BIBLE AS A HEALTH GUIDE.

MAN, the cope-stone of creation, fashioned, according to the Bible narrative, in the image of his Maker, consists of a material body joined in a mysterious manner to an immaterial spirit. Of these two, the latter was originally unamenable to sin and endowed with immortality; while the former was exempt from disease, perhaps free from that gradual decay of tissue and impairment of function that constitutes ageing, and also either immortal, like the soul, or so gifted that the latter was capable—either of its own accord or by God's fiat—of throwing the body off like an old garment, and passing—like Enoch and Elijah—painlessly, and without undergoing the distressing ordeal of disease and death, from this world into that of the future. This pleasant and happy arrangement, however, was soon marred by disobedience and consequent removal of Divine

support. With this, the one lost its sin-repelling, and the other its disease-thwarting power ; so that the one became liable to spiritual pollution and eternal death, and the other subject to physical ailments and temporal dissolution ; the pristine rule of undeviating health thus became obsolete ; while new laws, namely, those of disease, came into force. Unfortunately, for some mysterious though doubtless wise reason, our progenitors were not the only sufferers by this mishap, as their offspring inherited the curse and its sad results ; so that all mankind, except certain privileged ones who were translated, and certain people like the Israelites who were made temporally and partially exempt from disease and death, save when they sinned (Deut. viii. 2-6), became not only subject to pain, sickness, and final dissolution, but also prone to certain well-known and too often seductive agencies that are apt to interfere with health and curtail life.

Like some of the commonest things about us, such as gravity, light, heat, electricity, magnetism, and so forth, the nature of health and disease, life and death, which thus play so prominent a part not only in the history of the human race, but in the private career of every individual, is difficult to

define. This puzzle, probably the first philosophic problem of the earliest times, and one that has engaged the attention of the thoughtful of all ages, will, perhaps, ever remain enveloped in mystery. They have no material form to enable investigators to chemically or microscopically analyse or otherwise physically examine them; so that, in our mystified ignorance, we generally describe them by a negative, that is, by telling what they are not, which is really no explanation at all. Thus, as we say that light is the absence of darkness, and cold of heat so the best meaning that we can give of life is that it is the absence of death, and of health that it is the non-existence of sickness. We recognise the Divine source of both, however; and do not ascribe their phenomena to any self-existent and inherent power of matter.

The definitions here given, however, fall considerably short of the whole truth; for, practically speaking, disease and death are constantly watching to attack and overpower us. From the cradle to the grave the body is not only prone to assault from internal sources, but also everywhere surrounded externally by numerous and powerful morbid agencies constantly ready to fix on and disturb if not destroy it; so that, from first to

last, life is really a perpetual fight against death ; and health an endless struggle to avoid disease.

There can be no doubt, however, or dispute, about the value of both. There is nothing in this world dearer to all mankind than life ; and next to this, health is unquestionably the greatest of earthly blessings. Riches, honour, titles, position, and all else, are worthless without it. Nothing can compensate for its loss ; and hence the desire to preserve it is universal and strong ; while, on the other hand, sickness is in every way objectionable ; and includes waste of strength, money, time, comfort, happiness, and often life, as both public and private history prove. Many an invalid would cheerfully, like Job (Job x. 18), resign every earthly possession for a lease of the rude health of the rustic ; or like Hezekiah (2 Kings xx. 3 ; Job ii. 4), for a prolongation of that priceless boon called life ; and would subsequently make their care of both one of their first and greatest, instead of, as heretofore, one of their last thought of and least studied interests.

People of modern days are privileged in being able to choose between one or other of two different and distinct methods of dealing with the disease thus introduced. They may either *cure* or *prevent*

it. Although the former was the first devised mode, and, indeed, the main aim of medicine from the earliest authentic records ; the second plan, by which it is anticipated and avoided by judicious bodily management, obviously possesses great advantages. This constitutes the science and art of hygiene, otherwise termed health-preservation, or disease-prevention. And in its broadest sense this comprises whatever aids and perfects the growth of the human frame, preserves and increases its health, augments its vigour, and prolongs its existence ; it embraces laws that aim at the most perfect culture and prolonged vitality of mind and body, and also includes the various methods of lessening and repelling disease and death.

Hygiene, though written on and to a certain extent practised from the earliest ages, was much neglected till later times ; and, indeed, till the philosophical period of medicine, which commenced about B.C. 500. Its importance then began to be recognised ; but it was long till it acquired a satisfactory basis. In modern days, and especially within the last fifty years, it has developed into a far-reaching and all-important science. Unquestionably the most valuable and lasting medical advances of recent times are those made with a hygienic

object, while the practical worth of sanitation is popularly attested in the present age by the well-known and oft-quoted, though still too seldom followed, proverb, "Prevention is better than cure." So that progressive enlightenment is thus at last wisely adopting the ancient belief and precepts of the Bible.

Abundant proof can be given from many sources of the efficacy of hygiene, not only in increasing health, but also in diminishing sickness and lengthening life. Thus, Macaulay says that in London, in 1685, which was not a sickly year, one in every twenty persons died ; while in 1850, the mortality of the same city was only one in forty. And whether we take our statistics from England, France, America, or any other civilized country, we find that in all life has by these means, especially by improved public and private sanitation, been prolonged more than twenty-five per cent. during the past seventy-five years ; and the duration of sickness lessened more than one-third. The materially reduced mortality and length of residence in modern hospitals are also largely due to an improved system of hygiene. This proves incontestably that health and disease are both benefited by sanitary measures.

The basis of the art and science of hygiene is the belief that health and life may be oftener preserved, and disease and death oftener prevented by human effort, than they are at present. For although the ultimate dissolution of the body, either by disease or by extreme old age, is unavoidable, it cannot be doubted that both sickness and mortality are largely under the twofold sway of Him who permitted them to enter the world, and the beings whom they afflict; in other words, they are partly under God's control, and partly under our own.

The Bible fully proves the first of these two positions. Thus it informs us of God's continued interest in man and in his earthly abode; of His direct or indirect superintendence of the affairs of this world; and personal guidance of those nations and individuals who love and serve Him, and are willing to accept His temporal and spiritual sway. In God man lives, moves, and has his being (Acts xvii. 28). The Almighty is with him always and everywhere (Matt. xxviii. 20). Every hair of man's head is numbered (Luke xii. 7). Every event of his life is noted (Matt. x. 30). And if we lean on Jehovah, we need never be over-anxious about food, raiment, business, or indeed anything

else that is temporal (Luke xii. 22-32; Psalm xxiii.) And the reason of all this we find explained in the fact that *love* is the essence and highest attribute of the divinity (1 John iv. 8). God calls Himself our Father (Matt. v. 48); and regards us as His children (Gal. iii. 26); as sons and daughters (1 Cor. vi. 8); and will even come and make His abode with us, if we desire it (John xiv. 23); while to all mankind He makes offers as large and as liberal as He did to Solomon, who, when he asked for an understanding heart, also had riches, honours, and long life bestowed (1 Kings iii. 9).

Practical illustrations of this Divine care of individuals are found in the case of Uzziah, who prospered as long as he sought the Lord (2 Chron. xxvi. 25); of Zechariah, who was slain when he forsook God (2 Chron. xxiv. 21); Manasseh, who humbled himself in captivity, and was thereby restored (2 Chron. xxxiii. 13); and in the lives of the patriarchs and notables both of Old and New Testament times: while, on the other hand, His care of nations is shown so frequently all through the lengthy history of the children of Israel, that instances need scarcely be given (2 Chron. xxix. 9).

Moreover, the Bible distinctly proves God's

special influence over health and life, disease and death. His laws are "life to those who find them, and health to all their flesh" (Prov. iv. 21, 22). A promise of health and long life is held out to God's people; that is, to those who obey His moral laws, and also His physical laws or health-precepts (Exod. xv. 26; Isa. lxviii. 22; Prov. iii. 1, iv. 22, iii. 8; Deut. iv. 40, v. 33, vi. 6, xiii. 28; Lev. xxvi. 25); while from the opposite course of contempt and disobedience comes disease "till our flesh and body are consumed" (Prov. v. 7-11; Deut. viii. 2-18). So also consumption, burning ague, pestilence, and other evils are threatened for neglect of His commandments (Lev. xxvi. 16-25). Many curses, and among them disease and death, are also threatened (Deut. xxviii. 15-29, xxxi. 17). God threatened to exterminate the Israelites by pestilence for rebelliously refusing to enter the promised land (Numb. xiv. 12). And again, while foretelling that the Israelites would forsake Him, He threatens many evils, troubles, and among other things, sickness (Deut. xiii. 17). God kills and makes alive, wounds and heals (Deut. xxxii. 39). He heals and strengthens the sick (Ezek. xxxiv. 16; Psalm cvii. 20). In the Prophets, especially Jeremiah, menaces of punish-

ment by sickness, pestilence, etc., are frequent (Isa. xiv. 12, xxiv. 6, xxvii. 8, xxix. 17, xxxviii. 2). Job recognized that physical good and evil, health and sickness, are God-sent (Job ii. 10, v. 17, xxi. 27). David acknowledged that the issues of life and death are in God's hands (Psalm xxxvi. 9, lxviii. 20, ciii. 3). God giveth health and life (Acts xvii. 25), and taketh them away (Psalm civ. 29).

Many texts might be cited to prove God's general supervision of His followers' health and sickness, as of their other worldly affairs. Thus, first, as regards national welfare, all through the pages of the Bible we find instances where, for various reasons, God sent disease. Indeed, ancient Israelitish history may be called a record of alternate spiritual and bodily prosperity and adversity; or, in other words, of obedience, happiness, and health, varied by disobedience, sickness, and death; the health and life of the people being in one sense in God's hands, and in another mainly in their own. For example, for lusting after flesh many died of plague, probably caused by surfeit (Numb. xi. 33); as also did 14,700 people for murmuring against Moses and Aaron (Numb. xvi. 46); and likewise 2400 others for whoredom and idolatry with the Moabites (Numb. xxv. 8). Korah, Dathan, Abiram, and

250 men, were swallowed up for rebellion (Numb. xvi. 35). Emerods afflicted the Philistines for taking the ark (1 Sam. v. 11). The men of Bethshemesh, a priest's town, were smitten for irreverently looking into the ark (1 Sam. vi. 19). Many were slain of pestilence because David numbered the people against God's express command (2 Sam. xxiv. 16). The angel of death slew Sennacherib and 185,000 of his host in a single night (2 Kings xix. 35). Many were slain by fiery, that is venomous, serpents (which abounded in the desert, but had not previously harmed them), because they murmured for bread and water (Numb. xxi. 6). And for want of faith in God, and repeated, persistent rebellions, all who originally left Egypt were consumed—that is, died in the wilderness without seeing the so much desired “promised land” (Numb. xxxii. 13).

And the following selected instances will illustrate the same law—that of the special infliction of disease and death by God on individuals. Miriam was stricken with leprosy for murmuring and for speaking against Moses (Numb. xii. 11); and so was Gehazi for cupidity (2 Kings v. 27); and also Azariah for sacrilegiously burning incense in the temple (2 Kings xv. 5; 2 Chron. xxvi. 19). Jero-

boam's hand was withered for idolatry (1 Kings xiii. 5). Jehoram was smitten with an incurable disease for forsaking God (2 Chron. xx. 19). Elymas, the sorcerer, was struck blind for perverting the ways of the Lord (Acts xiii. 11). And, again, the more severe of the two punishments—namely, death—is illustrated by the case of Herod, who was eaten of worms for not giving God the glory (Acts xii. 23); by Ananias and Sapphira, who died suddenly for lying (Acts v. 5-10); by Judas, who burst asunder after betraying Jesus (Acts i. 18); by Ahaziah, who died for sending to inquire of Baal-zebub, the god of Ekron, about his sickness (2 Kings i. 17); and by Jeroboam, who was struck by God and died for making and worshipping golden calves, casting out the priests, and other idolatrous practices (2 Chron. xiii. 20).

In most of the instances here adduced from Old and New Testament history, God was sooner or later recognized as the sender of the affliction, while His clemency and power were also made manifest by *staying* or *checking* the infliction on the intercession of the tried individual or others. The New Testament is especially full of miraculous *cures*, either by Christ or His disciples; for example, of leprosy (Mark i. 40), palsy (Mark ii. 11),

withered hand (Mark iii. 5), issue of blood (Mark v. 30), deafness and dumbness (Mark ix. 35 ; Luke i. 64), blindness (Mark viii. 26, x. 52), lameness (Acts iii. 8), unclean spirits (Mark vii. 30, v. 13), epilepsy (Mark ix. 26), fever (Luke iv. 39), divers diseases (Luke iv. 40), the impotent, halt, and withered (John v. 1). Instances of resurrection from death are also given. Thus, Christ raised the daughter of Jairus (Mark v. 41), the widow's son of Nain (Luke vii. 15), and Lazarus (John xi. 44); and the Apostle Peter raised Dorcas (Acts ix. 40).

And, although special and open miraculous interpositions of Providence in the physical, social, and the religious worlds do not appear to form part of the Divine programme in modern as in ancient times, there can be little doubt that the Deity still manages earthly matters, though not perhaps in exactly the same manner as He did in Bible days, especially those relating to mind, morals, and health,—all three usually more amenable to control than such as are purely or chiefly material—and surely capable of being swayed by God when this is not unfrequently accomplished by man. And there can be as little doubt that both national and individual life are still, as in

Bible times, mainly in His gracious keeping. True, the infliction of disease by the Supreme, and its cure, are never openly witnessed in modern times; but doubtless they sometimes, perhaps frequently, occur, in a silent but no less certain manner. Life in every place, period, position, and age, is often marked with striking evidences of the inscrutable will of the Almighty. And doubtless now, as then, although He does not afflict willingly (Lam. iii. 33), these troubles—namely, disease and death—may be sent, either in anger (Job xxi. 17), or in punishment (Prov. iii. 11, 12), or in temptation (Job ii. 6), or to recall us to our heavenly allegiance (Psalm cxix. 7).

Still, even in these cases, man's health and life are, in a sense, in his own hands; and he might easily escape the effect simply by avoiding the cause. But altogether apart from this, these two unquestionably, in another sense, are still oftener and to a greater extent in our individual control; and may either be kept by following, or lost by neglecting, the ordinary and simple laws of health. Neither can sickness and mortality, whether public or private, be always regarded as scourges or as punishments for sin, except it be for the scarcely less aggravated transgression of neglected hygiene,

and the consequent withdrawal of the Divine protection and support. And thus, though we cannot doubt that disease and death are in every case Heaven-permitted, neither of them is, for the most part, God-sent, but purely self-inflicted. So that, in the great majority of cases, instead of the Supreme Being, or, as we often say, Providence, we have only ourselves, or our friends, neighbours, magistrates, rulers, and Government authorities to blame. Hence it follows as a corollary, that much of the sickness and mortality that now prevail is preventible, and therefore not only unnecessary, but a slur on and disgrace to our civilization; and also that, by proper care, the health of mankind generally might be more robust, and human life likewise materially lengthened.

We usually derive our hygienic knowledge from the accumulated experience of bygone ages. But, as already hinted, there is another and widely different source from which much information may be drawn, namely, the Scriptures. Putting creeds therefore for the present aside, and taking the Bible just as we find it in the ordinary versions, and examining it critically as we would any other literary production of note, we find that it says much, both directly and indirectly, regarding

health, and its various helps and hindrances. So that, besides their value as adding another to the many proofs of the inspiration and credibility of Scripture, the pertinent sanitary maxims found in the pages of this Book vastly increase its practical worth, both to private individuals and the world at large. We shall presently see in what respects and to what extent human experience agrees with or differs from Bible teaching; meanwhile it is well to notice that the Scriptures give very little information regarding the *cure* of disease; and the reason doubtless is, that as with sin so with sickness, God's laws are framed more towards prevention and avoidance than remedy, in other words, they are oftener hygienic than therapeutic; but at the same time, the minuteness with which the subject is handled, the strictness with which the rules are enforced, and the strong language in which they are couched, clearly indicate the supreme importance of prophylactic—that is, preventive—measures, in the estimation of the great Life-giver and Health-preserver.

The Bible is not, strictly speaking, a medical or hygienic treatise, or revelation in which health is the main subject; and therefore we cannot expect its sanitary suggestions to be either very pro-

minent or lengthy. Occasionally it speaks specially and discursively both on private and public hygiene. But far oftener the health maxims are incidental to the text, and imbedded in other more important matters, like precious gems in a setting of gold. Hence, they are generally condensed and pithy, but still they are invariably appropriate and unmistakable both in their meaning and application. Almost every one of the sixty-six books contains something; either a direct hint or an indirect promise or warning, which may be turned to practical account and made of hygienic value. In some places the maxims are numerous, especially in the Pentateuch, which contains the masterly public and private sanitary laws promulgated for the Jews during their wanderings in the wilderness. And so varied are they, that conjointly they contain all the ordinary information necessary to enable us to preserve health, prevent disease, and avoid death as far as the Supreme Author of all things and Great Disposer of events permits. But just as the Bible is not a complete but only a partial revelation of God, and merely tells us as much as is necessary for our salvation, so is it with its hygiene. On this subject it merely says what is absolutely necessary, and

does not always enter into minute details (Deut. xxix. 29); while many matters of altogether secondary importance are not even alluded to. Still, all the essentials and great landmarks for health-maintenance and restoration are there; while the rules regarding public hygiene—that is, the most important branch of the subject—are especially full and minute; thus making the Word of God the most concise and complete, as it is the most ancient, health-guide in existence; its sanitary science being in some respects in advance of that of the present day. So that candid inquirers, even those who deny the Divine inspiration of the Bible and consider it a purely or mainly secular volume, must admit that it is an admirable hygienic hand-book; a sanitary code which, if carefully and consistently carried out, would prevent many of the deaths and much of the disease which now abound, and make individuals, families, communities, nations, and mankind generally, not only stronger but also healthier and longer-lived than they now are.

Indeed, the Bible health-hints, as a whole, are mainly connected with the history of the children of Israel; a race to whom the world is indebted for the Saviour, the Bible, and an invaluable col-

lection of sanitary maxims. The history of this people, political, social, moral, intellectual, and spiritual, is given with marked minuteness ; and their wanderings, rebellions, murmurings, punishments, repentances, returns to God and repeated backslidings, even those of their specially endowed leaders, are chronicled with scrupulous accuracy, doubtless as an example and a lesson. For in these, men of every age and race find a type and counterpart of their own life, both individual and national. Like them we are fed and cared for ; but yet, like them, we often murmur by the way, rebel, sin, and suffer socially, morally, physically, and mentally : then repent, turn to God, and again prosper. So that, like the children of Israel 3,000 years ago, God's children of modern times are alternately happy or miserable, healthy or sickly, as they obey or neglect His spiritual, social, moral and physical laws.

Contrasted with other nations, the Israelites were, as they still are, a healthy and long-lived race. And in the wilderness their bodily welfare was as carefully watched over as their souls' interests. Having, therefore, no special need for physicians, they had none. Sprung from an ancestor doubtless selected for his physical and mental vigour as well as for his

moral and spiritual fitness, they were sustained by their excellent and strictly-enforced laws, designed to make them sanitarily and physically, as well as socially and spiritually, superior to other nations, and, in fact, the dominant nation of the world. But for their rebellion, their bodies would, doubtless, have been as well preserved as their raiment (Deut. viii. 4), until they reached the promised land. As it happened, so well were they protected from disease by God's personal superintendence, and so healthy were they kept by His admirable sanitary laws, that they only suffered occasionally from chronic ailments like leprosy, and from more acute and violent ones like plague. And in every case these afflictions were not only sent but also stayed and cured by Divine agency. Moses and afterwards Joshua were their chief sanitary officials and law-makers; while the high-priest and Levites were the health officers and agents for their cure; sacrifices, and the prayers of the leaders and of the people themselves being their chief resource in sickness; while hygienic measures, aided by a strict quarantine and special religious observances, were the only sanitary means employed in infectious and contagious cases.

We have thus both Bible teaching and human

experience from which to draw our hygienic knowledge; and of these it will be seen, from the following pages, that the former is the better of the two. Nor is it, even in a moral point of view, a matter of indifference whether we listen or not to what God's Word says on this subject. "Keep ye my laws" (Numb. xv. 40; Deut. vi. 25) is a commandment that applies to bodily as well as to spiritual matters, and includes every precept, suggestion, and warning in the Scriptures, and among others the health-hints (Psalm xix. 7, cxix. 118; Isa. viii. 26; Rom. ii. 14). And the latter were doubtless meant as much for the human race individually and collectively as for the Israelites, and as much for modern as for ancient times (Matt. v. 19). And just as in implicit obedience to the moral and spiritual laws of the Bible, we find the best chance of present and future happiness; so also strict attention to its hygienic or health laws is most likely to preserve health and prolong life. The physiological precepts are as compulsory as the moral code. The Scriptural sanitary maxims indeed amount to commands, and are clearly imperative on all who own allegiance to God. We have no more excuse for neglecting them than for disobeying the ten commandments;

and a more or less speedy and severe penalty is as certain to follow inattention to the one as carelessness with regard to the other. Like our moral and social, so our sanitary sins are sure to find us out (Deut. xxviii. 15, xxii. 35, xxxi. 17; 2 Chron. vi. 28; Numb. xxxii. 23). Clearly, therefore, it is as much our duty as it is our privilege to obey both implicitly (Deut. xii. 13). Life and death are evidently "talents" or endowments given us to keep and to cherish; and for our care of which, as for other gifts, we shall be hereafter called to account.

Viewed from this standpoint, health and life, disease and death, are clearly removed from the realm of fate, chance, or luck, and in a limited sense from that of Divine interference. Devised and established by the same Supreme Intelligence, the physiological laws that prevail on this earth are as well defined as the physical ones that emanated from and are continued by the same Great Original. In other words, those agencies which keep the body in health, are as clear and concise in their action and aim as those which sustain the universe, and govern the manifold operations of nature; for example, the laws of gravity, or those of light, heat, electricity, and magnetism. And just as aberrations in the laws

of matter cause the varied convulsions that we term storms, lightning, earthquake, and similar physical manifestations ; so, when we break the laws of health, we induce the different phenomena in the human frame that we term disease. Regarded thus, continued vigour of body,—that is, health, and length of days,—that is, long life,—are unquestionably much more at our individual disposal than commonly supposed. And on the other hand it follows that for much of the disease so prevalent among us we have ourselves (Psalm cvii. 17) directly or indirectly to blame, and not the Deity.

While, therefore, we wisely petition God to preserve our health (Philip. iv. 6)—that is, to keep us from disease,—our desire is clearly most likely to be fulfilled when we ask Him to bless and supplement our own carefully regulated action. Without this union of prayer and practice, Asa's fate may be ours (2 Chron. vi. 12). It is true that, whether our object be disease-prevention or disease-cure, we can never be certain that our petitions will prevail. But in either event we plead that our human may harmonise with the Divine will, feeling assured that whatever happens, even should the answer be adverse, all will be for the best, and our ultimate if not speedy benefit. The Bible

promises that God will hear and answer our prayers for health-preservation as He did those of the Israelites (Deut. xxx. 19, 20). He permits us to choose betwixt life and death, good and evil (Deut. xxx. 20). If we seek His face, He will deliver us from pestilence and death (Psalm xci. 3-7 ; 2 Chron. vii. 14, 15). He sends or He withholds "angels of evil"—that is, agents of physical evil, suffering, and destruction (Psalm lxxviii. 49). In trouble He is a present help (Psalm xlvi. 1), His aid being efficacious when man's fails (Psalm lx. 11). He listens specially to united prayer (Matt. xviii. 19). It is possible to have health withheld because we ask not (James xxi. 2), or because we ask for it amiss (James iv. 3 ; John xiv. 13, 14). Prayer for national health is also assured ; and neglect of the public and private sanitary laws of the Bible are equally unjustifiable (Deut. iv. 7, 8). And with an evident view of removing every vestige of excuse for non-compliance with His will, He says, "For this commandment which I command thee this day, is not hidden from thee, neither is it far off. It is not in heaven, that thou shouldest say, Who shall go up to heaven, and bring it unto us, that we may have and do it? Neither is it beyond the sea, that

thou shouldest say, Who shall go over the sea for us, and bring it unto us, that we may have and do it? But the word is very nigh unto thee, in thy mouth, and in thy heart, that thou mayest do it" (Deut. xxx. 11-14). We may, perchance, be left to our fate by God in this as in other matters, but only if we have forsaken Him (1 Chron. xxviii. 29; 2 Chron. xv. 2, xxiv. 30, xii. 5).

The human race at the present day, and in the light of modern science, may be regarded hygienically from three different points of view, namely,—

1. In their *animal* capacity and relation to the natural conditions essential to life which surround them; the air, food, and drink which they use, and that originate all their mental and bodily acts; the soil on which they live; the sun which warms, lights, nourishes them, and other things.

2. In their *mental, moral, and religious* capacity, with inner sources of action, thoughts, feelings, desires, and habits, which affect health, and require self-regulation and control.

3. In their *social and corporate* capacity; as members of households, subject to sexual influences, and as units of a community under political influences and customs, and affected by trades, dwellings, and such-like.

The hygiene included under the first and second heads is usually far more in man's personal control than that of the third variety. Nor can he always follow the indications of the latter, however much he may desire. Thus a soldier, sailor, or citizen may know how essential fresh air, good food, and pure water are for health and even life, and may even strive to have them, but yet have little or no power, because both he and they are under the management of others. Health-preservation is therefore subdivided into—

1. Private or personal, which regards man's individual existence.
2. Public or general, which deals with man in his corporate capacity.

But in connection with the latter there often arises a necessity for State interference ; and hence there has arisen what has been designated *State Medicine*, by which laws are made and carried out for the well-being and good government of the public at large, meant to protect them from the insecurity to life and health that too often results from the cupidity, ignorance, carelessness, or perversity of private individuals or companies. Even this, however, ought to be under the control of the people, since it too often happens that corpora-

tions, local, and even national governments, not unfrequently fail in their duty to the public who elect them.

Before entering, however, into the consideration of the special departments of hygiene, it will be necessary, in order to have a correct knowledge of the nature, aim, and importance of health-preservation, to have some insight into the structure of the human frame, and the use of its different parts, as the science has its basis in anatomy and physiology.

The body, then, consists of certain fluids, for example, the blood ; but mainly of various solid tissues that differ much in appearance, chemical composition, microscopic structure, and physiological use. These solids and fluids are variously divided and distributed, and by them larger structures, called organs or members, are formed, to which we give the name of muscles, nerves, glands, blood-vessels, and so forth ; while these again are grouped to form what are called systems, which may include several organs. Thus there is—first, the *osseous* system, or framework, consisting of no fewer than 260 different bones, by which the soft parts are supported ; second, the *muscular* system, including 480 muscles ; third, the *nervous* system, which comprises the nerve-centres or main tele-

graph offices called the brain, cerebellum, medulla-oblongata, and the spinal cord, and innumerable telegraph wires or nerves, to convey messages to and fro ; fourth, the *circulatory* system, consisting of the blood, the heart, or muscular pump which forces this onward, and the arterial and venous channels to carry this nourishing fluid to every part of the body ; fifth, the *respiratory* system, or lungs, that aerate and purify the blood ; sixth, the *digestive* system, comprising the stomach and intestines, in and by which digestion is mainly carried on, and the liver, pancreas, salivary, and other glands that contribute certain secretions to aid this process ; seventh, the *glandular* system, consisting of the kidneys and certain other glands scattered over the body to throw off certain excretions ; eighth, the *cutaneous* system, or skin, a most important emunctory for effete matters ; and ninth, the organs of *special sense*, namely, the eye, ear, nose, tongue, and skin, by which we see, hear, smell, taste, feel, and thereby hold intercourse with the external world.

The Bible gives no special anatomical details, although it often alludes to many of the bodily organs. But for general purposes, like the present, no more beautiful or accurate description of the diversity, relative importance, mutual relation

harmonious action, and unity of these different organs and systems in health and disease, can be found, even in modern works, than that given by St. Paul, when he says that "The body is one and hath many members; not one member, but many. God hath set these members every one of them as it hath pleased Him. The eye cannot say to the hand, I have no need of thee; nor again the head to the feet, I have no need of thee. They are not all alike strong. Nay, much more, those members which seem more feeble are necessary, and those members which we think are less honourable, on these we bestow more abundant honour. God hath tempered the body together that there should be no schism; but that the members should have the same care of one another; and whether one member suffer all the members suffer with it; and if one member be honoured all the members rejoice with it" (1 Cor. xii. 12). A nice adjustment of the physiological balance and harmonious action of the different systems, functions, and organs, constitutes health. Their disturbance, on the other hand, creates what we term disease. In either case, as the Bible indicates, if one is affected all the rest are secondarily influenced, more or less, for good or

for evil, for health or sickness. The important bearing of these fundamental, physiological, and pathological laws on hygiene will be apparent.

An equally perfect physiological description of old age, in highly poetic and figurative language, is also to be found in the Bible (Eccles. xii. 1-5). Its general gloom and insensibility to pleasure, dim eyes, weak arms, and tottering gait, shrill, unmusical voice, toothless gums, general timidity, broken sleep, hoary head, palled appetite and taste, and general sluggishness of every organ and function of the worn-out body, are all faithfully portrayed in these verses; while the same chapter gives an equally fine metaphorical description of death, or the final cessation of every vital function, and the consequent separation of the soul from the body that constitutes dissolution.

Many other apt Biblical illustrations of physiological truths might be given. Thus how truly the texts "The life of the flesh is the blood" (Lev. xvii. 11), and "The blood is the life of the body" (Deut. xii. 23), show the life-carrying virtues of the vital fluid, while they endorse and forestall Harvey's modern discovery of the circulation, which carries that all-important fluid to every part of the frame. So also how true is it, physically

and physiologically, that "a sound heart is the life of the flesh" (Prov. xiv. 30); and that a merry heart doeth good like a medicine (Prov. xvii. 22) is a truism within the experience of all.

These considerations will show that the human frame is neither self-sustaining nor self-regulating. Nor can it keep itself in health beyond a certain limit. The soundness of its members and of the whole body, the proper performance of its functions and their general condition, depend on, and are influenced by, certain external and internal agencies, through and by which health is maintained or sickness induced. These factors consist of:—

1. Those by which the body is sustained and grows: our food, drink, breath, the light which stimulates us, heat which warms, and clothing which protects us.
2. Those which purify the frame and keep it from defilement: cleanliness of the person, and of streets, communities, etc.
3. Those which refresh and invigorate us: sleep, work, recreation.
4. Those which keep the soul and the mind in health: moral, mental, and spiritual culture.

But besides the above, there are certain agencies that affect the sanitary welfare of communities, and

by which villages, towns, cities, nations, and even races, are liable to be influenced for good or for evil. The chief of these are :—

1. The site, size, ventilation, cleanliness, drainage, etc., of dwellings.
2. The cleanliness and sewerage of streets.
3. The modes followed for disinfection and disease-prevention.

The different agencies here enumerated, which may thus become sanitary or unsanitary according to circumstances, and prove either sources of health or sickness, are all, or nearly all, spoken of in the Bible at greater or less length. We shall now consider them in turn from a Scriptural point of view, beginning with the great landmarks of personal hygiene. But in order to make the subject plain to non-professional readers, and to show the full force and value of the health-hints of the Bible, it will sometimes be necessary, in the course of our remarks, to give certain general details regarding modern hygiene, as well as to explain the physiological laws on which health-preservation is based, and for the proper management of which these sanitary maxims were specially designed, and also to point out briefly the pathological evils or functional and organic perils that are apt to result from their neglect.

CHAPTER III.

ON PERSONAL HYGIENE.

AS a complicated machine or delicate musical instrument requires constant care to keep it in working order, so the marvellous design of that “harp of thousand strings”—the human body—needs hourly, nay, continuous attention ; especially if young and undeveloped, or hereditarily weak and prone to disease. Our frame is endowed with a certain vital resilience or power of repelling those numerous morbid agencies ever ready to attack us, and a certain capability of warding off disease and death. Still this gift is so limited, and the bounds of health so easily overstepped and difficult to regain, that it is manifestly our interest to aid it, by carefully seeking all sanitary and avoiding all unsanitary agencies. Fortunately, by acting thus, vigour and long life are much more at our own disposal than commonly supposed.

And just as each must strive to secure his own

salvation and future destiny (Philip. ii. 12), so each of us must work out the problem of his own temporal, that is physical, health and life, by strict attention to personal hygiene. And thus those who realize the great value of these blessings will see how necessary a personal knowledge of the details of hygiene becomes. No one has the same interest in us that we have in ourselves, or can look after our individual concerns so closely and constantly, even if they had the necessary inclination and opportunity. Although "they that are whole need not a physician" (Luke v. 32), healthy people constantly require their own or some other hygienist's advice for health-preservation. There can be little doubt that the time is fast approaching when physicians will be oftener consulted regarding the prevention of disease than about its cure. If, for example, children are liable to some hereditary malady, *e.g.*, consumption, or we ourselves to some acquired one, like rheumatism or gout, we should rather try to ward them off by hygienic measures, than wait till the disease has prostrated us. Under such circumstances professional advice is indispensable.

But there are many matters of minor importance about which we can consult no one, and must

therefore rely on our own judgment and experience, often more valuable in such cases than the best counsel of others. No one, for example, can regulate the ventilation of his bedchamber, or the amount of his diet, rest, labour, and so forth, so well as the individual himself. Besides this, medical opinion is not always at hand for emergencies—matters of greater moment—and special cases of declining health. Moreover, most people are as unlike in their bodily requirements as in face, figure, and character. Some have personal peculiarities and idiosyncrasies, so that each is individually the best judge of the diet, exercise, sleep, clothing, and general mode of life which best suits him, and knows best when to modify or change them. Children, however, unfit to judge for themselves, and also old people and servants, unable to act for themselves, must of course be hygienically watched and cared for by others.

But there are other cases which make a knowledge of hygiene invaluable, as, for example, to parents; for on constant and careful regulation of children's diet, exercise, rest, recreation, study, personal habits, moral discipline, and so forth, depend their present growth, as well as their

future strength, health, and even length of life and usefulness. A judicious attention to psychical and physical hygiene in childhood and youth will endow such as reach adult age with vigorous frames and well-balanced minds, that is the so much desired *mens sana in corpore sano* ; and may even convert children afflicted with congenital or acquired bodily or mental weakness, into strong, healthy, clear-brained, right-thinking, long-lived men and women.

An acquaintance with the main principles of personal hygiene is also necessary for heads of houses and larger establishments, in which relatives or friends dwell, and domestics or *employés* work, whose health is therefore very little in their own hands, because their diet, cleanliness, air supply, and so forth, are mainly or altogether under the control of a master or mistress, who cannot be constantly seeking advice, even if this is close at hand, and must exercise their own discretion, which clearly, therefore, ought to be educated.

A knowledge of personal hygiene is also useful, and indeed indispensable for private individuals in responsible positions, as, for example, magistrates, legislators, etc., in whose hands, as such, the health and lives of their fellow-creatures are

entrusted. Public sanitation is mainly based on private hygiene. A man unacquainted with the latter can neither rightly estimate the importance of the former, nor become capable of making laws, nor so convinced of their utility as to press their observance.

Systematic personal hygiene not only increases the health and vigour of the body and the mind, but prolongs life. As the body is most robust when not one, but every organ is sound and performs its functions satisfactorily ; so health is best kept and life prolonged, not by systematic attention to one, but to all the rules of hygiene. Disease is apt to follow disregard of any single rule ; and is all the more likely to occur if several are simultaneously broken. For example, a person who is careful of his diet, but inattentive to personal cleanliness, rest, recreation, etc., cannot expect to enjoy the most vigorous health. Nor can those who attend to physical hygiene, but neglect the rules necessary for their mental and moral guidance, with which the former is so closely connected. Many ailments follow a persistent disregard of hygiene that will be specially mentioned under separate topics. When all or several of the laws of hygiene are persistently broken,

disease is more certain, severe, and lasting. For instance, if a student or a sempstress neglects their diet, breathes confined air, takes too little sleep, overworks the body or the brain, neglects cleanliness, exercise, etc., and especially if they are guilty on all of these counts, various diseases, especially of the scrofulous type, are apt to ensue ; or if a fashionable lady or gentleman persistently interferes with the routine necessary for health, turns night into day, curtails sleep, breathes the tainted air of crowded assemblies and ill-ventilated bedrooms too often, while at the same time they neglect their food and over-excite their nervous and muscular systems, the body sooner or later becomes worn, emaciated, and a ready prey to disease. And similar cases might be given were it necessary.

The Bible gives many valuable hints regarding the most important objects of personal hygiene, especially on food, drink, air, clothing, rest, exercise, cleanliness, mental, moral, and spiritual culture. These shall be considered in turn. If we would be healthy and long-lived let us wisely study God's sanitary laws, and use the gift of common sense with which most people are endowed to interpret, and the energy which is equally innate, to carry them

into effect ; and thus “do His will” and perform our duty to ourselves by attending to our bodily interests as well as to our spiritual welfare. Our wisest policy for this world is to “walk with God,” by following His physical as closely as we do His moral laws. By constant attention to these, mankind would be individually healthier, longer lived, and more vigorous ; and we should have less sickness in our houses and large communities. All of us can help and encourage the practice of personal hygiene in many different ways ; and that without great sacrifice or inconvenience. The enlightened may aid the ignorant by instruction and by example ; while the rich may assist the poor both with their purse and with what is of equal value—kindly encouragement.

CHAPTER IV.

FOOD.

THE human body is constantly expending the solids, liquids, and gases of which it is composed; and hence their renewal is indispensable for the maintenance of its health and life. We furnish the so-called aliments thus required, in the shape of food, drink, and air; the first two being received into the system by the stomach, the last by the lungs. Thus introduced they are applied to different purposes. For example—*first*, to build the fabric up during the period of growth; *second*, to sustain it during adult life by replacing the worn-out particles constantly thrown off; *third*, to heat the body and keep it at a suitable temperature; *fourth*, to supply the stimulus which enables the muscles, nerves, brain, and other organs to act, every thought, movement, etc., involving either a waste of tissue or of stored-up food-power; *fifth*, to furnish material for the secretion of bile and

other fluids necessary for the digestive and other important physiological processes ; *sixth*, to make the blood a magazine of surplus material for tissue making, the elimination of heat, nerve force, muscular energy, and mechanical motion. Food is therefore an important and indeed necessary element in our existence. If the constant expenditure of the particles of the blood and body were not restored thus, our organs and the body generally would soon waste, become weak, unfit for work, and would ultimately prematurely die. The frame cannot be long kept in health, vigour, or life without it.

At the same time any or every kind of food will not do. It must have certain properties, thus :—

1. Our food should be of good quality. Healthy blood and strong tissues cannot be formed out of inferior materials, while common sense further indicates that unwholesome food is unsanitary.

2. Our food should be sufficiently abundant. Both an excess and a deficiency should be avoided, the former being a waste of food, hurtful to the body, and apt to induce various diseases, and the latter likely to cause an undesirable and perhaps pernicious loss of flesh and strength. No un-

varying law can be laid down as to the quantity we may individually consume, since this depends on age, size, sex, personal peculiarities, work, climate, season, and so forth. Dr. Edward Smith gives the following average quantity necessary per meal in temperate climates :—

	Carbonaceous.	Nitrogenous.
	oz.	oz.
Breakfast . . .	6·62	1·04
Dinner . . .	7·85	1·34
Supper . . .	4·52	0·59
Total . . .	18·99	2·97

A table like this, however, is only approximative and not applicable to every individual. However, we have each a pretty safe guide in the appetite and the sense of hunger,—those natural tell tales which are given to warn us when the body requires food, and has had enough. And hence, as a rule, it is wise to stop eating, however tempting the viands, as soon as, or even a little before, the craving is fully satisfied. Some require more than others. Nor does the quantity depend altogether on size, age, or sex. Persons of small frame often eat as heartily as those who are tall or stout. Dr. Letheby, however, gives the following as the daily average amount of the two chief

ingredients required during inactivity, hard, and active labour :—

	Nitrogenous. oz.	Carbonaceous. oz.
Idleness . .	2'37	19'65
Hard Labour . .	4'56	29'24
Active ditto . .	5'81	34'97

Again, during the inactivity and the intense heat of summer and warm climates, the body obviously requires less food than during the cold of winter, or that of frigid latitudes. Men eat more, generally speaking, than women by about one-tenth, to make up for greater activity—that is, tissue expenditure ; and adults more than children, though in proportion to size the latter usually consume most, to meet the demands of growth. Thus at ten, children require half as much, and at fourteen fully as much as women ; while young men not full-grown, but working hard, require more food than women. Working-men require more than idle or sedentary people, and for an obvious reason.

3. Our food should consist of *mixed animal and vegetable matter*. That it should be neither of these alone is proved by our instinctive desire for either if it is withheld. The teeth furnish another proof, as they consist partly of Incisors

for cutting, Canines for tearing flesh, and Grinders for crushing grain, and so forth. And if there should remain any further doubt that man is neither purely carnivorous, nor graminivorous, but omnivorous—that is, partly both—it is finally decided by the Bible, which shows that we are not meant to be pure vegetarians, as some aver (Gen. ix. 3, 4; Acts x. 16).

4. Our food should be regulated in *kind* according to season and climate, as has been already shown with regard to quantity. The body requires more flesh and fat—that is, strengthening and heating material—in winter and in cold latitudes; and more fruit, vegetables, and farinaceous food in summer and in tropical regions. This is proved by our natural craving for vegetables and fruit in high, and for animal food in low temperatures, and also by the providential distribution of these where most required; the natural home of the cattle, sheep, and so forth, which supply the one, being the cold and the temperate zones, while juicy fruits and vegetables abound most in warm latitudes.

5. Our food should have *variety*. Under too much sameness the appetite cloy; while change is both pleasant and healthy. Beef, for example,

should alternate with mutton, veal, poultry, and such-like. And these again may be varied by being differently cooked on successive days.

6. Our food should be eaten as nearly as possible in the form in which *nature* supplies it. Salting, pickling, preserving, and similar devices often alters and makes it less digestible and nourishing. Much disease, as, for example, the various grades of scurvy, and ailments with a scorbutic basis, is caused in this manner.

7. Our cookery should not be too *complicated*. The simplest is the healthiest as a rule. Good cooking is economical, and makes our meals both palatable and digestible. Bad cooking is the reverse, and doubtless is, both directly and indirectly, the cause of much indigestion and other ailments.

8. Food ought to be taken at *stated intervals*, to correspond with the periodic return of the appetite. Experience proves that, as a rule, three meals a day, one full and two smaller, are best ; and that the former should be taken in the afternoon or early evening.

Non-fulfilment of any or all of these dietetic laws is apt to be followed by serious results. The digestive organs rebel ; the elaborately ordained process which they perform becomes faulty ; the

body droops, suffers, at length succumbs to disease and even death. Important consequences follow a prolonged insufficient diet. The minor effects are often difficult to estimate, because they are often mixed up with those of other unsanitary agencies, as, for example, filth, over-crowding, deficient clothing and fuel, inclement weather, unsanitary houses, poverty, deficient water, light, and air. The greater results, however, are more tangible, and consist of failing health, emaciation, feeble pulse, sallowness, palpitation, giddiness, transient blindness on exertion, mania, apoplexy.

Disease necessarily influences the blood and flesh of animals, and makes them unhealthy; while putridity or semi-putridity lessens the nutritive value both of animal and vegetable matters. And although cooking doubtless partly destroys the venom of unwholesome food, there is evidence to show that much disease is thus occasioned, and no doubt many more ailments of an obscure nature. A privation of vegetable food is an essential cause of scurvy and other minor affections, and instances might be multiplied. Clearly, therefore, the selection of our food and the regulation of our diet are not matters of indifference. As a rule, each person is, or ought to be, the best judge of the

kind and the quantity of food, and the meal-times which best suit him. A good general rule in dieting is to follow whatever is found to agree, and avoid whatever disagrees, especially when the frame is temporarily or permanently weak. These remarks will also indicate the necessity for an individual study of the general principles of dieting and digestion.

The food we eat is very different in form, appearance, physical and chemical properties, from the flesh, blood, bone, and other tissues into which it is converted in the body. The process by which it is thus vitally acted on, and metamorphosed into those new forms is called digestion. The first and chief part of this function is performed by the alimentary apparatus, which includes the alimentary canal (gullet, stomach, small and large intestine), and different accessory glands (liver, pancreas, salivary). The food is first received into the mouth, where nature has provided a mill, namely, the jaws and teeth, by which it is prepared for digestion by being finely ground and softened by the saliva, in other words, masticated. The bolus is then swallowed, and descends to the stomach or main receptacle, where it is churned and mixed with the chief digestive solvent—the gastric juice—by from two to six hours' contact with

which it is fully dissolved and converted into an insipid greyish semi-fluid mixture called *chyme*. This passes by degrees into the small intestine, where it is mixed with two other special secretions, namely bile and pancreatic juice, that convert it into *chyle*, which soon separates into three parts—a whey-coloured fluid, a creamy layer, and a sediment. The process is then complete. The former two, that is the nourishing parts of the mixture, are then absorbed as they pass along the small and the large intestine, the remainder being the innutritious and undissolved refuse.

Our ordinary food consists chiefly of four different ingredients variously combined; viz., *first*, the albuminous—nitrogenous, or fleshy; *second*, the fatty; *third*, the saccharine and starchy; and *lastly*, water and salines. These have very different uses in the economy. Thus the albuminous repairs the muscles, supplies them with motor power, and helps to heat the body. The fatty also supplies motor power, and is the chief heat-producing agent. The saccharine and starchy help to generate caloric and force; while the water and salines assist the others. All of these should be present in our diet, since none of them can singly sustain life. So, also, articles of food deficient in

one thing, should be associated with such as have an excess ; *e.g.*, milk, butter, or cheese with bread ; butter and oil with fish, and so on. Every dietary should have vegetables. Combinations like these aid digestion. The proper proportion of these different constituents necessary for a healthy man of average size and weight, performing a moderate amount of work, is thus calculated by Letheby :—

	Aveirdupois oz.	Per cent.
Nitrogenous substances .	4.587	22
Fatty „ .	2.964	9
Saccharine „ .	14.257	69
Saline „ .	1.056	

The different secretions of the alimentary canal are meant to dissolve and transform these, that is, *digest* them. The gastric juice is the principal and general solvent ; while the pancreatic juice acts on the sugary and starchy particles ; the saliva aids the gastric and pancreatic fluids ; and the bile dissolves the fatty and oily food. None of these secretions can entirely fulfil the function of the others. And therefore if not properly mixed with these alone, food containing any or even all of the four above-mentioned constituents is likely to pass through us undissolved and undigested.

Digestion is a vital process, partly mechanical,

and largely chemical. Chemistry is one of the most wonderful of the sciences, and chemists can do strange things. For example, they can convert one substance into a totally different one ; solids into fluids or gases ; the latter into the former, and so forth. But no chemist can equal, far less excel, the marvellous physiological chemistry which is constantly, silently, and spontaneously going on throughout nature, and nowhere more persistently than in the human body, especially in the process of digestion and during the conversion of food into different tissues. No chemist can convert vegetables into milk ; milk into brain or muscle ; bread into flesh ; flesh into blood or bone ; and all the different articles of food into the many distinct and diversified tissues of which the human body is composed. No earthly chemist can transform inanimate matter into *living* tissue ; or cause it to produce startling *vital* actions like muscle contraction, nerve force, thought, and so forth, so difficult even to explain. But the chemist's own body can ! So that natural—that is, God-created and heaven-directed—surpasses human science, and performs feats that man, however gifted, cannot accomplish.

Like all complicated chemical operations, digestion is easily deranged, and requires great care and

nicety of adjustment, otherwise the physiological result is unsatisfactory; and we find that, with singular appropriateness, it is chiefly against errors of this kind that the Bible warns. But the full force of the Scripture health-hints regarding food and dieting will be still better understood, if we first point out what happens, when the delicate requirements for healthy digestion, already mentioned, are not fulfilled.

1. If food is hastily, and therefore insufficiently masticated, and "bolted" almost entire, the hard angular lumps are apt to bruise, and perhaps lacerate the soft and delicate lining membrane of the stomach, a result obviously detrimental both to that organ and the digestive process.

2. Hasty mastication means imperfect admixture with saliva; and half digestion of the starchy and sugary food, which is thus not only wasted, but also apt to cause irritation; while the body may also suffer through deprivation of a special aliment; nor can the gastric juice penetrate lumps of food, so that only their outer surface is dissolved, the remainder being thus wasted,—a matter in itself of small importance, but for the fact that it now becomes apt to irritate, gripe, and even cause disease as it passes down.

3. As the quantity of saliva, gastric juice, bile, and pancreatic juice secreted in health, is generally only sufficient to dissolve the food which the body requires, or can take up; it follows that if more food is eaten at one time than is necessary; or if we feed too frequently, or again partake too freely of any particular kind of diet, the excess is not digested, but is wasted, and apt to decompose, cause irritation, indigestion, and various other ailments; while the body may further absorb, and ultimately become loaded with imperfectly assimilated materials, not only ill adapted for secretion, tissue making, and so forth, but also likely to cause blood plethora and other ailments.

4. If, by eating too often, we add fresh food to that which is already half digested, the entire process is likely to be interrupted, and various irritative ailments induced.

5. If highly irritating food—for example, spiced, pickled, or salted food—is eaten too freely, the delicate lining membrane of the alimentary canal, especially the stomach, is apt to inflame,—a fruitful cause of indigestion and other diseases.

6. If the gastric juice, saliva, and other secretions are suddenly and largely mixed, and thereby over-diluted with water by copious drinking, they

cannot properly dissolve the food ; the resulting chyme being irritative, and unfit for absorption or nourishment.

7. If, while digestion — which requires a stomach temperature of blood-heat (98° to 100° Fah.)—is in progress, too much iced water or cream, wine, or other cold fluids is taken, the process is apt to be interfered with or stopped, and indigestion and other ailments induced by the sudden and great reduction of temperature, amounting perhaps to from 40° to 70° Fah.

Digestion and the nutrition of the body may thus be disturbed in various ways, and by nothing more surely and severely than by loading the stomach with superfluous food, when every one of these physiological requirements is apt to be ignored. Nature has kindly permitted us to enjoy the ingestion of food ; but, as with every other desire, it is clearly necessary, in gratifying the sense of taste, to exercise our individual judgment and self-control, and neither indulge too freely in dainties (hurtful articles, however enticing), nor even in ordinary food. It is truly marvellous, considering the delicacy of the process, and the little attention that is often and perhaps usually given to our dieting, how nature carries it on so

long and successfully as it often does. Non-professional minds can scarcely credit the enormous amount of disease caused by faulty digestion. If constant attention of the kind here indicated were given to dieting and the process of digestion, an enormous saving of pain, discomfort, and disease would undoubtedly result. A single disregard of any one of the necessary conditions may cause embarrassment and illness, especially when the stomach is naturally weak; while a host of more serious and lasting maladies are indirectly occasioned by a persistent continuance in the evil habit, in which every organ, function, and part of the body may ultimately become involved, but especially the kidneys, liver, skin, and other excreting organs. And it is well to remember that it is not only those of naturally puny frame and weak digestion which may so suffer by a continuous neglect of this important function, but the very strongest.

The necessity for a careful observance of the above rules, especially that enforcing deliberate and systematic mastication, is of especial value to a busy nation like this, where food is often hurriedly eaten; and so also is that regarding change of diet according to temperature, in those places

—as, for example, the States of America—which border the Atlantic seaboard, or similar regions, in which the difference between summer heat and winter cold is great ; while that regarding regional dieting is equally important in countries like America, whose territory lies in all three zones,—the torrid, temperate, and the frigid,—between which, active citizens are constantly making rapid interchanges by travel, for amusement or business.

The Bible gives very frequent hints regarding food and dieting. In the Desert, the chief articles of Israelitish diet were manna and quails ; the former supplied the place of vegetables, scanty in that region. Again, in Canaan they had bread, cakes or cracknels of wheaten flour, baked corn, wheat, and barley (Lev. ii.), flesh, fish (Neh. xiii. 16), olive oil, dates, grapes, figs, prunes, lentils, pulse, beans, butter, cheese, honey, goats' milk, and vinegar. Goats' milk was largely consumed. Corn, wine, and oil, were the principal products of Judæa.

This list is more curious than useful, as the habits and bodily requirements of the people, and the climate and natural productions of their country, were considerably different from ours. Their food was not very different in kind ; but they used some things more largely than we do.

Their supply of grapes and oil was plentiful; but temperate regions like those in which most civilized nations like ourselves live, have vegetables and grain in greater abundance. The chief difference lay in their mode of cooking their food, which was simpler, and therefore, perhaps, in a sense better than ours.

The Israelites were not permitted to select their food, and were only allowed to eat certain things, while others were forbidden. Animals, whether four-footed beasts or fowls (Exod. xxii. 21), which had died of themselves, or been torn, were forbidden (Deut. xiv. 21; Lev. xvii. 14; Ezek. xlv. 31), doubtless because the former might be diseased, and the latter poisoned. This law is clearly good for the present day, and one which should be publicly enforced. Meat should always be fresh. And there should be no question about preventing its sale when putrid or diseased. So also of unsound milk, or unwholesome, decayed, or mouldy vegetables, which are alike dangerous to health and life. Fat and blood were not to be eaten by the Israelites (Lev. iii. 17), doubtless from sanitary considerations. Under light work and a warm climate, these fattening, warming, and stimulating varieties of food were apt to cause or

increase both laziness and corpulence. This law, taken broadly, should also be followed at the present day by sedentary or inactive people, especially in warm seasons and countries. The Israelites were also forbidden at an early period to eat flesh with the blood in it, thus : "Ye shall eat the blood of no manner of flesh, for the blood is the life" (Gen. ix. 4, 5). And this rule was repeated to the tribes in the wilderness, under penalty of being cut off (Lev. i. 14; Deut. xii. 23). Even strangers were included in this observance; and before eating meat had to pour the blood out, and cover it with dust. The law was made principally, to increase the typical value of blood as an atoning agent; but partly because any blood-disease, which the animal might have, would be concentrated in that all-pervading fluid; and lastly, to keep the Israelites from certain cruelties in which neighbouring nations may have indulged, like the semi-barbarous Abyssinians, mentioned at a later day by Bruce, who cut out and devoured flesh from the flanks of living animals. The Israelites were also forbidden to eat the sinew of the hollow of the thigh which shrank (Gen. xxxii. 32); but this was evidently a special and temporary ordinance to keep them in remembrance of an im-

portant episode in the life of their great progenitor, Jacob.

Again, in order to keep the race holy and separate from other nations that were figuratively deemed unclean (Lev. xx. 24-26), it was also against the Jewish law (Lev. xi. ; Deut. xiv.) to eat the following unclean animals in which those strangers indulged: all *beasts* which go on their paws, including the predatory or flesh-eating quadrupeds, such as the lion, tiger, etc. ; and also the coney, or rock rabbit ; the horse and camel, which are hoof-parted ; also swine, which are not cud-chewers ; and also the weasel, mouse, and the mole. The unclean *birds* that were forbidden included the predatory list, and those that have rank flesh, namely, the eagle, osprey, ossifrage, vulture, kite, raven, owl, night-hawk, cuckoo, hawk, little owl, cormorant, swan, pelican, gier-eagle, stork, heron, lapwing, bat. The unclean *fish* that were also denied were such as had no fins or scales, which includes the shark tribe, all of which are predatory and animal devouring. The tortoise and the lizard were also forbidden, and likewise the snail, the serpent, and other creeping animals, as well as centipedes and other many-footed insects.

On the other hand, those so-called *clean* animals

which the Israelites were permitted to eat (Deut. xiv. ; Lev. xi.), included all cud-chewing, hoof-parted, cloven-footed beasts. For example, the ox, sheep, goat, roebuck, fallow deer, wild goat, bison, wild ox, chamois. Also those fishes which had both fins and scales ; and also insects which both fly and leap ; as well as flying and creeping insects that have legs above the feet, that is leaping legs ; for example, the locust, grasshopper, and so forth, the bald locust, and the beetle.

This law enjoining a careful selection of food was doubtless part of their civil, moral, and religious education, and was broadly given, like other commandments, to teach them obedience ; as well as to keep them isolated and distinct from neighbouring nations, into whose dietetic errors they might have fallen ; and because of the tendency which certain kinds of food have to produce disease in their peculiar climate and mode of life. Although this law is neither universal nor perpetual, and the interdict regarding clean and unclean men and other animals no longer exists (Acts x. 15 ; 1 Tim. iv. 4)—nothing which God has made being now deemed unclean or forbidden in the Israelitish or biblical sense of the term—still experience tells us that it is prac-

tically judicious, and therefore good for us in the main; for, singularly enough, the Mosaic list of unclean animals includes those which popular instinct, experience, and taste have long selected or discarded for dietetic purposes. Those forbidden were mainly carnivorous and carrion feeders, and those allowed were chiefly vegetable and grain eaters. The Mosaic law is therefore consistent and far-seeing; and it is wise to endorse a rule that we have so long unwittingly followed, seeing that it is biblically, experimentally, and theoretically commendable. It is an interesting fact that the Mosaic laws and customs, and the distinctions between clean and unclean animals for food, are still kept up among various classes of people in modern Judæa, though not exactly as Moses ordained.*

Although the Bible warns us against being over anxious about what we shall eat and drink (Philip. iv. 6; Matt. vi. 25), thereby inculcating not only trust in Providence, but also indifference to gastronomic indulgences, and does not give any explicit and pointed rules regarding dieting, even to the Israelites, still it contains some very valuable hints that ought not to be ignored.

* Thomson's "Land and the Book," p. 193.

Beyond the above-mentioned restrictions, the Bible says little regarding the *kind* of food we ought to eat, but leaves its selection to natural instinct and common sense ; because, when thus guided, we cannot far err in our choice. Solomon's prayer, "Feed me with food *convenient* for me" (Prov. xxx. 8), clearly indicates the necessity for providing varieties suitable for different idiosyncrasies, ages, sexes, etc., as well as for the different seasons of the year, and the varying changes of climate to which we may be exposed if we change our latitude. The Bible gives us a very important hint regarding infant feeding when it speaks of 'milk for babes and strong meat for those of full age" (Heb. v. 14 ; 1 Cor. iii. 2). This law is often broken in modern times in two ways. Sometimes the natural food for this tender age is wrongly and unnecessarily supplemented, or even supplanted, by stronger animal or vegetable food. In other cases its use is continued when stronger food should be given. Both reason and physiology indicate that after a certain period the mother's milk becomes watery, weak, and unfit for infant nourishment ; while both the parent and her offspring are apt to be subsequently weakened by the unnatural and unnecessary drain.

The Bible does not give much advice about the *quality* of our food, because it is unnecessary. For, while we ought to "receive the meats that God hath created with thankfulness" (1 Tim. iv. 3), we naturally choose the best we can get or can afford. At the same time we may observe that the Scriptures always speak of "fine" and "finest" wheat, and so forth, as the best and most desirable (Psalms lxxxi. 16; cxlvii. 14).

Many texts indicate the justifiability of judicious *cookery* to convert our food into "savoury," that is, *tempting* dishes such as suit individual tastes (Gen. xxvii. 4).

Regularity in dieting is clearly inculcated in accordance with our physiological requirements when we petition for our "daily" bread (Matt. vi. 11), and that we may have our food supplied "in due season" (Psalms civ. 27, cxlv. 15; Eccles. x. 17; Matt. xxiv. 45; Luke xii. 42).

The latter subject necessarily has much to do with the *quantity* to which we ought to restrict ourselves, a matter in which most people are thoughtlessly apt to err, either from eating too often, or from taking too much at one time. On this subject the Bible does not often speak; but what it does say is particularly strong and pointed.

And although "the living God giveth us richly all things to enjoy," and thereby constitutes eating one of the permissible pleasures of life ; while the necessity for each person having enough food is implied in certain texts (Luke xv. 17 ; Exod. xvi. 8), we clearly do not require more than enough, because we ought only to eat for strength, that is, to sustain the body (Eccles. x. 17). Still, people of all ages and conditions, the infant, the adult, and the octogenarian, rich and poor, savage and civilized, are prone to the alluring habit of over-indulgence in food. In nothing, therefore, have we more need for advice. The text makes no remark about under-eating, that being a fault which few are likely to commit, or to persist in so long as to be detrimental. Neither is moderate festivity condemned, for Christ and His disciples attended the marriage at Cana (John ii. 1) and the banquet given by Levi (Luke v. 30). A sufficiency is what is commended (Prov. xxx. 8). And the health hint, "Abstain from fleshly lusts" (1 Peter ii. 1), clearly inculcates moderation in eating and drinking as well as in all other bodily desires and appetites (Prov. xxv. 16). It is the temptations which beset feasting, and especially voracity and over-indulgence, which are so strongly decried. Moderation is advised even in the appa-

rently most harmless articles, such as honey (Prov. xxv. 27). Paul's hint on this point is invaluable, "Meats for the belly and the belly for meats : all things are lawful for me, but I will not be brought under the power of any" (1 Cor. vi. 12). This clearly indicates the constant necessity for self-control with regard to this appetite. Gluttony, especially over-eating of flesh (Prov. xxxiii. 20, 21) is always decried, deemed as bad as drunkenness and riotous living (Deut. xxi. 21 ; Matt. xi. 19 ; Luke vii. 34), and strongly warned against in the following terms :—"When thou sittest to eat with a ruler, consider diligently what is before thee, and put a knife to thy throat if thou be a man given to appetite. Be not desirous of his dainties, for they are deceitful meat" (Prov. xxiii. 1-3). Though on cursory inspection these few sentences do not appear much, they evidently have a threefold meaning, and not only warn against sychophancy, but against over-indulgence in the alluring pleasures of the table, and also against the unvarying use of *dainty* food, lest it lead to surfeit and sickness ; so that, like the handwriting on the wall, their importance is not discovered without study and interpretation according to the rules of dieting.

Here, as elsewhere, the sacred book assumes

not only that we personally study its pages, and especially its sanitary precepts ; but also that we individually take proper care of our health and life, and know the general principles of judicious dieting. A man who cannot control his appetite at a stranger's table, is even less likely to do so at his own board, and is thus constantly apt to overstep the bounds of prudence. So that the above warning, read in the light of the previously-mentioned physiological facts, really amounts to this,—Seest thou one with no self-control, who is a frequent and perhaps habitual glutton, and thereby often breaks the laws necessary for proper digestion in one and perhaps every particular, there is more hope of a fool than of him. And this, inasmuch as a fool may be pliant and will amend if persuaded ; whereas a stubborn glutton will neither listen to reason nor alter his ways, and is therefore worse than a fool, because he is not only breaking God's laws and incurring His anger, but is injuring himself by wilfully tempting immediate disease, and thus persistently throwing away his best earthly blessing, health.

It will furthermore be apparent how important it is for the national health, vigour, prosperity, and happiness, to have a plentiful supply of pure and

unadulterated food. The evil effects of deficient bad, adulterated, or improper food on large bodies of people is well seen in the medical history of armies in the field, fleets at sea, cities during siege, and countries during famine, when disease is not only very frequent, but also very fatal, and the general health much below par; while the opposite effect of a plentiful supply of good food is equally apparent in the superior healthiness of the masses during periods of prosperity, when food is cheap and abundant.

CHAPTER V.

DRINK.

THE different tissues of the human body, even the densest, invariably contain a certain percentage of fluid. In some, like the bones, the proportion is small ; in others, like the blood, it is very large. The basis of this in every instance is water, which, like the solid particles, is being constantly thrown off, and hence requires frequent renewal. Thus water, an article of which we never weary, and one which is everywhere bountifully provided, is clearly man's natural beverage, and may be regarded as only a variety of aliment. And so important is this element in the economy, that pure water, good food, and fresh air may be called the tripod of life. Liquid in some form—in other words, water—is even more necessary than solid food to sustain and develop the frame, and enable it to carry on its different functions. Dire distress and even disease speedily follow a deficient supply,

and still more a complete *deprivation*, of water, as shown by the harrowing details of shipwreck. When stinted, thirst is the first symptom, which is followed by a great lowering of the muscular strength and mental vigour; the blood thickens; the tissues individually, and the body generally, shrivel, till ultimately mania and death ensue from exhaustion.

But it is essential that the water so employed should be pure, inasmuch as sickness is even more likely to follow impurity than a scanty supply or deprivation of fluid. For example, if mineral waters, such as salines, iron, lead, etc., are in excess, they may ultimately occasion goitre, headache, lead-poisoning, palsy, and so forth. While again, the presence of vegetable matters may cause diarrhoea, dysentery, ague, and other ailments. Animal matters originate cholera, enteric, dysentery, diarrhoea, and other affections. So also yellow fever, typhoid, typhus, scarlet fever, measles, small-pox, and other contagious diseases, and not a few non-contagious ones, such as dyspepsia, diarrhoea, dysentery, cholera, gravel, calculus, worms, and other ailments, may originate in special sources of contamination with soluble and insoluble, organic and inorganic substances. And thus, in short, some of the most serious diseases known may be

introduced into our bodies, families, communities, or the nation, by the agency of water; and thousands thereby impaired in health, and even carried off prematurely.

But water is as necessary for cleanliness as it is for drink; and disease is apt to be indirectly induced in various ways when the supply for this purpose is deficient. Thus sickness may arise from the clothes being unwashed or re-washed in the same water, by the food being cooked in too little water, or in the same water more than once; or by houses becoming dirty, the streets uncleaned, the sewers unsluiced and therefore clogged, and the air thereby contaminated in various ways. From one, or from all of these combined, may spring a general lowering of the public health, and an universal predisposition to disease. Hence it will be apparent that an abundance of wholesome and pure fluid is a fundamental sanitary necessity, not only for individuals but for communities. So, also, the source of our private and public water supply, its storage, distribution, quantity per individual, and above all its composition, and freedom from animal, vegetable, and mineral impurities, are all matters of the greatest moment, and subjects that should never be overlooked.

Good water, whether derived from rain, wells, springs, rivers, lakes, or distillation, should be clear, of pleasant taste, and without smell. And every house should be so supplied that there is no stint for drinking, cooking, personal ablution, baths, clothes' washing, house cleaning, and domestic sewerage. The average amount required per head has been estimated by Parkes at four gallons. But this is not sufficient for the daily ablution of the whole body, and a proper supply of clean underclothing. So that a safer minimum supply would be twelve gallons per head. And if we add for baths and perfect cleanliness, it should be raised to sixteen gallons. The additional allowance for waterclosets and refuse should be six gallons, and for waste three gallons more. But even this total of twenty-five gallons must be greatly increased if public baths are used. Those of ancient Rome, the largest the world has ever seen, required three hundred gallons per head daily. In warm, and especially hot seasons and climates, the supply required for bathing, washing, etc., would raise the daily quantity to thirty gallons. Hospitals and sick people necessarily require a larger amount than healthy persons and private houses. The following table will show

how far short the supply of modern cities is of the, no doubt, extravagant expenditure of Rome.

Daily consumption of gallons per inhabitant:—

AMERICAN CITIES.

	Gals.		Gals.
New York	95	Boston	60
Chicago	80	Philadelphia . .	56
Hartford	80	Cincinnati . .	53
Reading	75	Baltimore . . .	50
Albany	75	Lowell	44
Buffalo	63	Cleveland . . .	43
Brooklyn	60	Providence . . .	30
S. Louis	60	Milwaukee . . .	25
		San Francisco . .	45

EUROPEAN CITIES.

	Gals.		Gals.
Dublin	60	London	33
Glasgow	52	Liverpool . . .	30
Paris	38	Manchester . . .	21
Edinburgh . . .	35	Sheffield	20

The biblical allusions to water for ablution and cleansing purposes generally will be more conveniently pointed out under the head of cleanliness (Chap. ix.) And this will permit us to confine our attention meanwhile to the use of this and other liquids for drinking purposes.

The chief beverages of the ancient Israelites

were water, milk, and wine. Vinegar, really a weak acid wine, cheap and refreshing, was also much used by labourers (Ruth ii. 14). As with other nations, however, their principal drink was water, and when pure and cool was then as now considered the best of beverages (Job xxii. 7). Water and bread were, and still are, the main supports of life in the East. In warm regions like Egypt, the Sinaitic Peninsula, and Judea, a liberal supply of water was both necessary and grateful. Wells were dug at great expense outside their camps and cities, that is, as far as possible from sources of contamination, and were considered valuable property. Hence the frequent strife and serious quarrels for their possession, such as that between Lot and Abraham, and between Jacob and Esau. Isaac was a great well-digger, on account of his vast flocks, and no doubt dwelt near that of La-hai-roi (Gen. xxv. 11). Many an interesting conversation and important transaction happened at or near these Palestine wells, where the people, especially the females, resorted in the evenings to draw water for their cattle and home use. Thus, the Angel of the Lord met Hagar by a fountain of water in the wilderness (Gen. xvi. 8), and subsequently

opened her eyes to discover another, which in her anxiety she had overlooked (Gen. xxi. 19). Rebecca may be said to have been betrothed to Isaac at the side of a well (Gen. xxiv. 15). Isaac's servants strove with the herdsmen of Gerar about the possession of wells (Gen. xxvi. 20-21). Jacob first met his future wife Rachel at a well (Gen. xxix. 2). The *pit* into which Joseph was cast by his brethren was probably a dried-up well (Gen. xxxvii. 24). Moses first met his wife Zipporah at a well (Exod. ii. 17). Christ's never-to-be-forgotten conversation with the woman of Samaria happened by the side of a well (John iv. 6).

In the desert water was scarce, and therefore precious. The Israelites realized its great value when they lacked it (Exod. xvii. 2); and subsequently relished its sweetness when Moses drew it from the rock at Meribah (Exod. xvii. 7); and again at Marah, when it became bitter (Exod. xv. 24). In the East it was, and still is, considered a mark of hospitality and a great compliment to offer water to the weary (Job xxii. 7). Even a cup of cold water given in kindness to a disciple of Christ will neither be unappreciated nor go unrewarded (Matt. x. 42).

The great value of water and of wells in that

region was forcibly shown when they were stopped up, that being the surest way to convert a flourishing country into a wilderness (Gen. xxvi. 15) Israel was commanded to destroy the Moabitish country thus, that people having to go elsewhere when the supply for themselves and their cattle was suspended (2 Kings iii. 19-25). Hence also why, in Uzziah's time, towers and castles were built to secure possession of valuable wells (2 Chron. xxvi. 10).

The carefulness of the Israelites in having a plentiful supply of pure water, not only for private but also for public use, and of keeping the fountain pure and away from recognised sources of impurity, is noteworthy and deserving of imitation in modern times; both where the main source of supply consists of ordinary wells, as in villages, and where it is drawn from reservoirs and other receptacles, as in towns and cities. Both are apt to be contaminated not only at their source, but also during the downward flow of the fluid through tanks, conduits, and pipes; for example by soakage of animal and vegetable matter from outhouses, dirtheaps, cesspools, drains, and so forth. The supply per head also is often deficient in modern times. And while the upper and

the middle classes have an abundance, the poor and the working classes and tenement houses, that need it most, have often far too little. With the ample opportunities and great mechanical genius of modern times, our water supply ought to be, and might easily be, practically unlimited, both in town and country; and much more perfect than that of the Israelites, and even that of the Romans already spoken of.

Among the Israelites, milk stood next in favour to water as a beverage. It was wholesome, nourishing, and their supply was abundant. They had no wine in the wilderness; and afterwards this fluid was regarded by them more as a luxury than as a necessity. And the consideration of the subject of wine and the strong drink so often mentioned in Scripture, naturally leads to the oft-discussed and long-agitated question, whether they, and also the various kinds of alcoholic beverage in use at the present day, are useful, necessary, and allowable, or the reverse? Does the Bible advocate free and full enjoyment, abstemious use (Job xxii. 7), or total abstinence from them? It sometimes strongly recommends the use of wine, and sometimes condemns it in equally forcible terms. How is this apparent

discrepancy and seemingly conflicting advice to be explained? The matter is one of national as well as individual importance, and therefore worth study.

The subject has been well examined. And among others by Ritchie, who enters into the philology of the subject, and points out that the translators of the Scriptures have used the generic word *wine*, which occurs 261 times in the text, as the interpretation of no fewer than eleven different words, of which nine are Hebrew and two Greek. These imply totally distinct liquids, that should have special names. Nehemiah while Governor of Jerusalem speaks of providing "all sorts" of wine for his household (Neh. v. 18), which proves that more than one kind was in use. The different varieties of *wine* spoken of in the Scriptures are—

1. *Tirosh*, which occurs thirty-eight times, and means vine fruit in its natural state of *grapes*, or dried into *raisins* ;
2. *Eshishah*, which occurs four times, and means *cakes* made of grapes ;
3. *Asis*, which occurs five times, and means the *juice* that sometimes drops from the grape clusters as they grow ;

4. *Sobhe*, which occurs three times, and means inspissated wine, or the *boiled juice* of the grape ;

5. *Chemer*, which occurs eight times, and means the sweet *unfermented juice* foaming from the vat in its fresh but turbid state ;

6. *Shemarin*, which occurs four times, and means old and pure *wine on the lees* ; that is the richest and best wine ;

7. *Mesech*, which occurs three times, and means *wine mixed* with myrrh, mandragora, opiates, and other strong drugs, to create or increase its intoxicating qualities ;

8. *Shechar*, which occurs twenty-three times, and is a general name for the alcoholic and therefore *intoxicating liquors* made from dates, grain, and other fruits ; with the exception of grapes ;

9. *Yain*, which occurs one hundred and forty-one times, and is a generic term for *all* the different kinds of Bible wine ; and sometimes signifies, *first*, the growing grapes, *second*, the newly-expressed, sweet, and unfermented juice of the grape, otherwise called *must*—new wine—and pure blood of the grape (Deut. xxxii. 14), which contains no spirit, and is therefore non-intoxicating ; and *third*, every species of fermented, that is, spirituous and intoxicating wine ;

10. *Oinos*, which occurs thirty-two times in the New Testament, and is a generic Greek term for *different kinds* of wine;

11. *Glenkos*, which occurs once, and means sweet unfermented grape juice or *must*, drunk by the ancients in the morning.

Differences of opinion still exist regarding the true nature of some of these; but on the whole, the definitions here given may be received. And judging from the Bible texts so translated, some contend that the Scriptures enjoin total abstinence from wine and all other alcoholic beverages; and it is well to consider briefly on what grounds. The advocates of this doctrine point out: *first*, that where the word *Tirosh* occurs, the use of this is spoken of as a blessing, and is invariably praised (Psalm iv. 9; Prov. iii. 10, etc.); but at the same time they hold that as this term means "grape fruit," and not a liquid at all, this furnishes no argument in favour of the use or benefit of alcoholic wines and beverages, nor does it sanction our indulgence in them. Nay, even though *Tirosh* did mean, as some translators aver, the sweet, unfermented, non-alcoholic juice of the grape, a liquid as bland and as harmless as milk, the Bible texts which commend this would not encourage or

sanction the use of alcoholic wine and other spirituous beverages, either of that era or of the present day.

Again, Eshishah, or grape cakes (2 Sam. vi. 19); Asis, or grape droppings (Amos ix. 13); Sobhe, or boiled grape juice (Isa. i. 22); and also Chemer, or unclarified grape juice (Deut. xxxii. 14), are all praised on the whole, and may therefore be regarded as permitted enjoyments. They are all simple, bland, nutritious, and non-intoxicating; so that their rational use can hurt no one; and none can adduce the Bible sanction of these as an argument in favour of modern wines and other alcoholic liquors. Thus the first five of the above varieties of Scripture "wine" may be put aside as witnesses in the argument for or against the use of alcoholic beverages. This necessarily lessens the kinds on which we have still to sit in judgment to the last six, all of which are liquid, and principally alcoholic.

Of these, Shemarin, or old wine on the lees, is spoken of favourably once (Isa. xxv. 6), and warned against twice (Jer. xlvii. 11; Zeph. i. 12); Mesech, or drugged wine, is strongly condemned, in accordance with the dictates of common sense (Psalm lxxv. 8; Prov. xxiii. 10); Shechar, or

strong fermented alcoholic liquors, are also invariably spoken of in terms of disapproval, and forbidden to be used in sacrifice to God (Lev. ii.); or by the priests (Lev. x. 9); or by the Nazarites (Numb. vi. 3); or by the people for common drink (Prov. xx. 1, xxxi. 4; Isa. v. 11, 22). Nothing is said by which we may infer the nature of Oinos; but in the New Testament its use is sometimes sanctioned and in other instances condemned, most probably from two different kinds being alluded to, one fermented and intoxicating (Ephes. v. 18), and the other unfermented and harmless (John ii. 1-8). Again, Glenkos (Acts iii. 13) probably means an intoxicating wine, but the only passage in which it is found does not sanction its use. Clearly, therefore, none of these varieties can be adduced in testimony of the permitted systematic use of the wines and other alcoholic beverages of the present day, any more than they can those of Bible times; even Shemarin, the variety which most closely corresponds to modern wine, is alluded to in terms of warning.

The chief interest of the argument in hand lies therefore in the remaining word Yain, that is, in the term which occurs oftenest, is found in the writings of all of the sacred penmen, and in every

variety of circumstance, sometimes in terms of approval, in other cases as a permitted enjoyment, and again in others in loud and decided tones of warning and admonition. For once it is approved of, however, it is condemned thrice; a fact that can be explained only by supposing that the term is a general one, and includes several different kinds of wine, and not only the fresh juice of the grape (Chemer), but also the fermented juice (Shemarin), and also drugged wine (Mesech); the first of which is meant when its use is either praised or not blamed; and the latter two when it is cautioned against, on account of their intoxicating tendency; so that Yain, also, like the other varieties of Bible wine, clearly does not sanction the use, either ancient or modern, of alcoholic beverages.

Some of the Bible texts speak very strongly against wine, and denounce it as "the poison of dragons and venom of asps," and as "destroying and deceiving man." Nine passages of Scripture expressly prohibit it in certain cases; and five wholly forbid it under all circumstances. Now it is reasonable to infer that where this occurs, it is clearly the alcoholic and the drugged varieties that are meant. Of the whole number of texts in which

the word *wine* is mentioned, only twenty-four of them speak of it as a permitted enjoyment; and these doubtless allude to simple, unfermented, non-alcoholic grape juice or *must*, like that now so much prized by the people of modern grape-growing countries, though uniformly used mainly or only by them, on account of the difficulty of getting and keeping it elsewhere.

It was doubtless this variety that God desired as a drink offering (Exod. xxix. 40); that Solomon likened to wisdom (Prov. ix. 2); that Jesus made at Cana (John ii. 2); that David credits with "making glad the heart of man" (Psalm civ. 15); and that is figuratively alluded to in the passage "Ho, everyone that thirsteth, come, buy wine and milk without money and without price" (Isa. lv. 1).

Still, the Bible unquestionably approves of alcoholic wines and spirits under certain circumstances, and especially when they are required medicinally. Thus, "Give strong drink to him that is ready to perish, and wine to those that be of heavy heart" (Prov. xxxi. 6, 7), may be regarded as professional hints for the judicious physician. In serious sickness, when there is great mental and bodily depression, so that life is at a low ebb, and requires temporary stimulation to

help it over its difficulties and prevent it succumbing to its adversary, wine and spirit, wisely employed, have doubtless saved many a life. The wine (*Oinos*) of which Paul recommended Timothy to take a little for his stomach's sake and his oft infirmities, was doubtless a tonic, strengthening, mildly alcoholic variety ; so that in mild ailments, it may also be legitimately and beneficially employed.

Thus the true interpretation of the Bible teachings regarding wine and spirituous liquids generally appears to be as follows :—

1. Unfermented wine (Must or grape juice) is alone approved of and therefore permitted.
2. While neither total, nor habitual, nor pledged abstinence from alcoholic beverages are strictly enjoined by the Scriptures, the second of these—that is, habitual abstinence—appears to be indirectly suggested and advised.
3. Their excessive use, however—that is, their abuse—is invariably strongly condemned.
4. Their judicious medicinal employment is approved of when this is either necessary to preserve health or to cure disease.
5. Abstinence, pledged or non-pledged, as occasion may require, to help others against the folly

of over-indulgence, is praised, and thus indirectly enjoined.

Taking a broad view of the whole subject, it may be said that, as a rule, the Bible plainly and distinctly *enjoins* whatever tends to promote God's honour or our neighbour's welfare; and on the other hand, as clearly *forbids* whatever may lessen or injure one or both of these, as, for example, idol worship, Sabbath breaking, murder, theft, and so forth; while, again, it only *cautions* against those which may militate against ourselves, like the use of alcoholic beverages. And the reason of this is plain. We are here as free agents in ordeal. As such, but yet endowed with a conscience to distinguish between what is right and what is wrong, and gifted more or less with the mental counsellor called common sense, and furnished, moreover, with the Bible as a guide-book, we can either indulge or refrain from them at will, and thereby obey God or disobey Him, retain our health or run the risk of losing it. But even when it is necessary to use the permitted or the medicinal kinds either of wine or alcohol, the Scriptures clearly inculcate *temperance* in this as in all other matters involving health and life.

This is proved by the fact that the Israelites are

cautioned against surfeiting (Hosea iii. 1)—that is, harming themselves even with grapes (*Tirosh*), or with grape-cakes (*Oshishah*), or with *Asis*—that is, grape-droppings (Isa. xlix. 26), or with boiled grape-juice—that is, *Sobhe* wine (Nahum i. 10). Again, the New Testament warns against “walking in *excess* of wine” (1 Peter iv. 3). Paul gives a similar caution when he says, “Be not *drunk* with wine” (Ephes. v. 8), and subsequently inculcates that “a deacon should not be given to *much* wine” (1 Tim. iii. 8), doubtless for example’s sake. In these instances unfermented wine is doubtless meant. And again, when he advises the use of fermented wine, he clearly suggests that it should be employed in moderation, thus, “Take a *little* wine for thy stomach’s sake” (1 Tim. v. 22).

Evidently, therefore, the unnecessary or excessive use of alcoholic beverages is only one of the natural or acquired appetites and desires against which we have to contend, and which we ought to use our utmost self-control in trying to check. Being even cautioned against their moderate use, mainly because this is apt to open the door of temptation to greater indulgence in an alluring but depraved taste; their *excessive* use is so much the worse. Drunkenness is reproachfully termed

"a work of the flesh" (Joel i. 5). Wine-bibbing is classed with gluttony, and wine-bibbers with publicans and sinners (Matt. xi. 19; Hosea iv. 11; Hab. ii. 5). The use of much wine, a phrase clearly indicating a slighter degree of intemperance, is reprov'd by Solomon (Prov. xx. 1, xxiii. 29); while woe is predicted against drunkards (Isa. xxviii. 1-7), and they are enumerated among those heinous offenders who shall be excluded from the kingdom of God (1 Cor. vi. 9, 10; Gal. v. 19-21).

The wines and spirituous beverages of the present day are far more numerous and varied than those of Bible times. They also differ still more widely in origin, colour, taste, strength, and so forth; and yet resemble these and also one another in this respect, that they have a common basis, namely, alcohol. So that to all, modern as well as ancient Jew and Christian, the health-hints of the Bible on the subject of wine are obviously applicable. The various kinds of spirit in present use, namely, brandy made from wine, rum from sugar, whiskey from barley, rye, etc., and other varieties, that like these consist mainly of alcohol, correspond to the Shechar of the Bible. Again, modern wine, which is equivalent to the Shemarin of Scripture, is of many different degrees of strength, and varies from

the light French and Rhenish varieties, which contain from eleven to four per cent. of alcohol, up to port, Marsala, and so forth, that have from twenty-one to twenty-six per cent. Other favourite alcoholic beverages, such as cider and perry, show from seven to nine per cent.; while the many varieties of ale, beer, porter, stout, and so forth, now in use, have from one to eight per cent of spirit. The evil effect of these and similar alcoholic beverages is materially aggravated by their frequent and great impurity; for, as well known, even the different kinds of spirit in common use are often adulterated; while a not inconsiderable part of the wine annually consumed in some countries, especially the cheap varieties, contains only a very small proportion of true grape-juice, being *manufactured* and subsequently fortified by alcohol. Much of the so-called ale, beer, and other much-used fermented beverages of certain countries are similarly made by the aid of drugs of various kinds, such as quassia, strychnia, cocculus indicus, and contain neither malt nor hops. With all of these many different varieties of alcoholic drink, both the pure and adulterated, the effect of course depends, as with the wines of the Bible, on the quantity used, its strength, and also the frequency

with which it is indulged in. A small amount of a mild alcoholic beverage may do little or no appreciable harm, and may even do some good ; whereas a larger amount, and especially a debauch, will do infinite mischief by causing intoxication, a result which becomes all the more injurious the more frequently it is repeated.

The question regarding the admissibility or not, of alcoholic beverages as an ordinary article of diet, or even as a luxury, and of the quantity of these, or of their active principle alcohol, supposed to be good for, or at least not injurious to health, cannot be satisfactorily settled, without considering their effects on the body. This necessarily leads to the inquiry, Does medical science agree with, or differ from Scripture regarding their use? Does the former—in other words, do physiology and hygiene—advocate temperance or total abstinence? Most people will grant that, from the latter two points of view, the *excessive* use of intoxicating fluids is wrong. But the question remains, Is their habitual use, when not carried to the verge of intoxication, either necessary or healthy? Are they judicious, even in small quantities? And if so, what is the amount compatible with health?

It cannot be denied that, in small quantities they often appear to act physiologically, that is healthily, and seem to aid digestion ; but in other cases it is decidedly the reverse. And, possibly when the former happens, it is always, or mainly, in cases of weak digestion, and where the stomach, or the system requires a medicinal stimulus of this kind. In larger amount the effect passes beyond the bounds of health, and becomes distinctly pathological. The warm glow, felt in the stomach after drinking, is a pathological sign and warning of mischief, that arises from the delicate membrane that lines it, being reddened and congested. In cases of persistent drinking, the stomach ultimately becomes permanently congested and catarrhal, causing impaired digestion, and other ailments, such as enlargement and disease of the liver ; while the lung work is lessened, chronic bronchitis and asthma being thereby induced, and the pulse and heart quickened ; wakefulness also ensues ; the all-important chemical changes constantly going on in the blood, are arrested ; and the development of fat is increased. Over-indulgence in spirituous liquors deadens the nervous sensibility, lessens the power of thought, blunts the senses, diminishes the activity of the voluntary

muscles, and causes a fall of temperature. These facts, based not on theory but on experiment, and therefore all the more trustworthy, prove that the habitual use of large quantities of wine, spirits, or even weaker alcoholic beverages, such as ale, porter, etc., are hurtful. Parkes, an eminent authority, gives from one to one and a half fluid ounces of absolute alcohol as the utmost daily limit which a healthy man may safely use without actual or apparent detriment. Women should take less than this. So also, by almost universal consent, alcoholic liquids in any shape are deemed injurious to children; and the very small quantity which intoxicates them shows that they not only absorb it rapidly, but also tolerate it badly.

But although the above-mentioned quantity cannot be distinctly proved to be hurtful to adults, another question arises, Is the use of alcohol or spirituous beverages, even to this moderate extent, necessary or desirable? Whether are we healthier, happier, more vigorous in body and brain, or longer lived, with them or without them? If they are distinctly hurtful in larger quantity, is not this amount perhaps injurious in a minor degree? Is there no subtle harm done to the system that observation has hitherto

failed to detect? These questions are important, for if answered in the affirmative, it would clearly be wise to abstain entirely from alcoholic beverages. The problem, however, is a difficult one to solve, owing to the complexity of the many-tissued, many-organed body, and the almost inappreciable and occult action of small quantities of the agent employed. However, we may reasonably infer that it is hurtful, though more slowly, insidiously, and to a less extent; and also that the detriment is probably cumulative, and doubtless great and dangerous in the course of years. Would it not, therefore, be more judicious to prevent this result by avoiding its cause, than to indulge, and subsequently suffer the inevitable penalty?

The abstruse question, so difficult to solve by direct evidence, is perhaps best determined indirectly. Statistics have fully proved that intemperance causes a vast loss of health and life; while they further indicate the great advantage which total abstainers have in the maintenance of these, even over moderate drinkers, that is, people of temperate habits. Both scientific observation and popular experience show that, both under the most common, and under the most important conditions to which the human frame may be exposed,

the use of intoxicating, that is alcoholic beverages, is decidedly hurtful. Thus:—

1. We know that they are not preservatives against winter or Arctic cold.

2. That they do not lessen, but rather aggravate, the bodily heat, both in summer seasons and tropical countries.

3. That they are hurtful during hard work or severe exercise like that of working men, and lessen the power of sustained exertion.

4. That they are also hurtful during mental labour, and are not brain food.

5. That they are injurious while food is deficient.

6. That they are deleterious during seasons of great exposure and exertion.

7. That there is good reason to believe that they do not help the body to resist such diseases as cholera, yellow fever, dysentery, ague, etc.

8. That they do not impart strength to the body

9. That even in moderation they impair hope and cheerfulness, and increase crime.

Although it cannot be distinctly proved that the moderate use of spirituous liquors is hurtful, and their use therefore altogether to be con-

demned, their dietetic value is doubtless greatly over-rated. As an article of diet they are certainly not necessary for all, although they doubtless are for some. There are people of weak stomach or infirm frame, who are not quite sick, yet not quite well, but just, as it were, on the verge of disease, who find themselves decidedly the better for a moderate use of light wine, beer, cider, or some other beverage, which apparently becomes both of medicinal and of dietetic value. Are not these perfectly justified in acting on St. Paul's advice to Timothy, "Drink no longer water, but use a little wine for thy stomach's sake and thine oft infirmities"? (1 Tim. v. 13). The same condition may also occur temporarily even to otherwise healthy people, and warrant the occasional use of some spirituous stimulant drink.

But, on the other hand, most people are decidedly better in health, strength, and spirits without alcohol in any form, even in moderation. Why, therefore, should not these, of their own accord, and without pledging themselves to abstinence, avoid, as a rule, what is doubtless hurtful, or at least not strictly beneficial, and indulge only when health absolutely requires it?

Again, for those unfortunates who are dipso-

maniacally addicted to the excessive use of intoxicating liquors, in one shape or other, the only safety and chance of cure, is to leave them off at once and completely. In their case a pledge is the only safeguard. There is no satisfactory intermediate course. Lastly, not only Bible teaching, but also public opinion, approves of total abstinence followed for example's sake, and to hold out a helping hand to the class to whom we have just alluded (Romans xiv. 21; 1 Cor. viii. 13).

On the whole, therefore, it appears to be left very much to our own discretion, and to medical advice, when necessary to decide whether or not alcoholic beverages, or alcohol in one or other of its many forms, are individually necessary. In this, as in other hygienic matters, common sense and conscience must both be exercised. And the question already propounded may be answered very much as Paul did that regarding marriage. If necessary for health, we may indulge *in moderation*; but if not strictly needful, and especially if bad effects follow, it is better to abstain. The Bible decidedly approves both of habitual abstinence and of temperance, while intemperance is as distinctly condemned. Clearly,

it is the abuse of alcoholic beverages, in other words, their use in excess, which is hurtful. In this it is as with all other good things, and therefore their proper use is clearly defined, "Be not *drunk* with wine, wherein is *excess*" (Ephes. v. 18). The quantity which may be considered necessary and temperate, of course varies according to individual peculiarities, age, sex, size of body, and so forth; and to decide regarding this, personal experience and common sense must be our guides. As a general rule, however, it may be well to remember that wherever digestion is interfered with, the senses, intellect, or locomotion impaired, we may be certain that the quantity taken has been too great; nor should partakers ever forget the growing desire and seductive habit of indulgence, or cease to carefully ward against both (Rom. vii. 18, 19).

On the whole, therefore, we may conclude that in this, as in other matters, science and Scripture, medical experience, and Bible teaching agree, and that :—

1. Habitual abstinence is healthy, and advisable for all whose health can bear it, that is for the majority of people.
2. That habitual abstinence is especially neces-

sary, and indeed obligatory, for those with whom alcoholic beverages, even in small quantities, disagree or intoxicate.

3. That, for example's sake, where total abstinence can be borne without detriment, this is praiseworthy if not obligatory.

4. That, except for those included under the following head, temperance should be the law and rule for persons who find it a health duty to occasionally, frequently, or regularly take wine or some other alcoholic beverage.

5. That frequent and even occasional intemperance is wrong, and not only a sin against God's moral code, but also against the laws of health, and therefore likely to be doubly punished.

CHAPTER VI.

AIR.

AN abundance of pure air is the most constant and urgent necessity of animal existence. The biblical expression "breath of life" (Gen. ii. 7) indicates the vital importance of this animating agent to man. Without it the body could neither begin nor continue its wonderful career. It is the first thing which vivifies the infant frame; and one of the last physiological phenomena of the worn-out or disease-stricken body is the cessation of respiration. "God sendeth His spirit and we are created; He taketh away our breath and we die" (Psalm civ. 29, 30). Air is more necessary to us than food. Health is most vigorous and life longest when the supply is abundant and pure; and for hygienic purposes it is well to remember that we live in and breathe the lowest, and therefore densest, stratum of the atmosphere, that nearest to the earth's surface, where, for obvious reasons,

it is most apt to be vitiated and deleterious to health and life.

Death by drowning and other modes of suffocation show that life cannot exist for many minutes under a total deprivation of air, while the disastrous effects of the Black Hole at Calcutta on the confined British prisoners, of whom 123 out of 146 died in a single night of eight hours' length, illustrates the effect of a deficient supply. And statistics prove that, when less stinted than in this notable example it not only directly, but indirectly induces disease; and ultimately death. When a limited supply like this is prolonged, many serious evils, and a still larger number of minor ones, result. The semi-oxygenated poison-laden blood becomes black, impure, unhealthy, and not only unfit to nourish old and make new tissues, but unable to sufficiently stimulate the muscles to move, the brain to think, nerves to telegraph, and the different organs to secrete the bile, saliva, and other secretions, and excretions of the body in due quantity and quality, so that life thereby languishes and may ultimately succumb. And even if the latter event does not occur, that weak state of frame is induced, which predisposes to the induction of various diseases, especially scrofula, consumption,

and so forth. In such cases the air becomes vitiated by the breath, and other excretions; although it is often not the contamination which injures or kills, so much as the want of a fresh supply of pure air—that is, of its vital stimulus, oxygen.

On the other hand, when the atmosphere contains solid or gaseous impurities, it is these which are more directly hurtful, and even deadly. The usual additions, of this kind, may consist of invisible vapours and gases; as, for example, carbonic acid, and watery vapour from the skin and lungs; or of smoke, and noxious gases from factories; or of malaria, and other emanations from the earth itself. Or the foreign ingredient may be fine; and often, microscopic plants and animals; or inanimate solid particles of dust, from the ground, the body, our clothing, dwellings, trades, and so forth. So, also, the minute germs of the most frequent and serious diseases which afflict mankind—especially those of the infectious type—are, no doubt, carried about by the air, till they meet with a suitable person in whom to locate and develop.

These matters enter the system, which they thus hurt, by various channels. Noxious vapours or gases, for example, those of charcoal, first enter the lungs, and through them the blood, by which

they speedily spread, and poison the entire frame. The lengthy respiration of a small aerial impurity, as from stagnant water, gas-evolving factories, etc., and even the close atmosphere of private dwellings, especially bedrooms, in which most people spend one-half (or even two-thirds of their lives) is also a very frequent cause of ill-health and weakness ; especially among children and young people, whose undeveloped and delicate frames are particularly susceptible to such unhealthy agencies, and less able than adults to withstand them. Solid impurities, again, are most frequently drawn into the lungs, where they are apt to create serious disturbance, of various kinds, by mechanical irritation. Coal-dust is thus a frequent cause of consumption among miners ; fine sand, and chippings among stone-cutters ; and steel-dust among knife-grinders. And it is well to remember that some of the most dangerous of these air-vitiators, especially the invisible gaseous ones, have neither taste nor smell, so that these two senses, like that of sight cannot be considered an infallible test of atmospheric impurity. The evil effects of deficient, or impure air, are necessarily materially increased when other unsanitary agencies, such as scanty or bad food, deficient clothing, heat, or sleep, anxiety,

fatigue, etc., are conjoined : a common enough occurrence in daily life ; especially among the ill-fated working-classes and the poor, who often suffer much from this unfortunate combination of morbid causes.

Fortunately for us, Nature removes some of these impurities in her own beneficent, and generally very simple way, and thus restores the atmosphere to its normal state, by a wonderful system of compensations ; otherwise the air would soon become unfit to sustain life, as it now exists. Thus, plants absorb some of the noxious gases, and notably carbonic acid ; and give out others which are healthy, such as oxygen. The ozone of the air, itself oxydises many organic substances, and thus renders them innocuous. Suspended dust falls, by its own weight, or is beaten down and washed away by the rain. Malarious, and other gases, and vapours rise, and mix with the air, which dilutes and renders them comparatively harmless ; the wind—Nature's ventilator—carries off, and diffuses others, and thus the general atmosphere is kept, in what we term a state of purity, that is, fitness for respiration.

The Bible says nothing about foul air, or ventilation ; but the great danger of the one, and the

importance of the other, are shown indirectly and forcibly, by the carefully planned and executed public hygiene of the Israelites. The primary aim of this, and especially the speedy removal of excreta, garbage, ashes, and lastly lepers, was clearly meant to ensure cleanliness; and thus mainly to keep the air free from noxious, and especially disease-generating matters; and is a notable practical illustration of a doctrine, taught by the Bible, long ere it was thought of and epitomized in the modern proverb "Prevention is better than cure."

The patriarchs of Bible times lived in tents, that is, so to speak, in the open air of sub-tropical Asia (the probable cradle of our race)—Judea, Egypt, and the Wilderness. This was neither too hot, nor too cold for their scantily clothed skin; while it allowed the impurities, vapours, and gases thrown off by their bodies, to be carried away by natural ventilation; namely, by the law which causes gases to mix by diffusion, and by the wind that still further disperses them. Their tents were sufficiently open to permit this to go on freely. Practice thus proved what theory teaches, viz., that when practicable, tent life is very healthy.

But the spread of the race, its migration into colder regions, and the exigencies of modern civilization, ere long necessitated the construction of the closer dwellings of turf, wood, brick, stone, or iron, now used by most nations. But, though these possess the advantages of greater warmth and seclusion, they are apt to have certain sanitary disadvantages, inasmuch as the emanations from our bodies, and other impurities, such as those which arise from cooking, sewerage, washing the dwelling itself and its contents, are apt to become pent in (especially in winter), when, in excluding cold we are very apt to keep foul vapours in. If allowed to remain to contaminate the air, these are apt to weaken the body, and may ultimately cause disease; and hence, whenever it is possible they should be constantly and effectually removed, as fast as they are formed, and fresh air introduced. In other words, the atmosphere of private dwellings, workshops, factories, etc., should not be permitted to stagnate, but ought to be constantly renewed from without. Where there is no escape for the confined air, as is likely to happen, we ought to make one. As *natural* ventilation is prevented by the walls and roof, we should resort to

artificial ventilation. The mode of satisfactorily effecting this, is one of the great puzzles of modern hygiene, and a subject too extended for us to enter into here, though both interesting and important.

To ensure purity of the atmosphere, it is therefore a matter of great moment, everywhere and in all circumstances, to have properly ventilated dormitories, dwellings, halls, assembly rooms, churches, etc.; and of equal import that children should have well-aired private and public schools; that our fellow-creatures should have airy, not over-crowded tenement houses, stores, workshops, warehouses, and factories; that our aged, infirm, and poor should have well-ventilated hospitals, homes, and asylums; and even that our criminals should have well-aired reformatories and prisons.

Where individuals, or bodies of people cannot regulate the ventilation, to have this done for them, is no less a matter of duty to them, than of safety to ourselves, and even the nation. For in this manner we may assist in making our fellow-citizens, and it may be the race, healthier, more vigorous, and longer lived. While, by giving servants, children, workpeople, and even paupers and criminals pure air, the development of wide-

spread and deadly epidemics, in which we ourselves, or those dear to us, may be involved, can often be prevented. These are not mere theories, barren of results, but suggestive facts; from the acceptance of which valuable consequences have already accrued. Thus, to give only one instance—on finding that the mortality among children in the Dublin Maternity Hospital, amounted during the first fortnight of life to, “one in every six children,” Dr. Clarke happily thought of improving the ventilation; and by this innovation alone soon reduced the mortality to “one in every nineteen and one-third.” A similar increase in health and corresponding diminution of disease, unquestionably follows every improvement in the ventilation of private dwellings, especially bedrooms, as well as that of public buildings, small and large. Nor, should it be forgotten that, it is *constant* attention, or inattention to the minute details of such hygienic matters as this, that, in the end, makes the sum-total either of health, or disease.

CHAPTER VII.

EXERCISE.

WORK is essential to health, life, and happiness, and therefore man was born to work. The law of labour was one of the institutions of Paradise, Adam having been put there to cultivate the garden in the days of his innocence, and before it was compulsory to toil for bread (Gen. ii. 16); labour being then not only pleasant but profitable; good for his intellectual, moral, and physical well-being; calculated to keep his entire frame in tune, and make rest sweet.

But in Paradise work was either light, or did not beget a sense of fatigue. After the fall, however, bodily labour induced exhaustion, as it still does,—a legacy and memento of the Edenic transgression. Work then became toil, and, once voluntary, was made compulsory, the command “Study to do your own business and to work with your own hands” (1 Thess. iv. 11) having become as applicable to that early period of man’s history, as to New Testament times, and to the present day.

Still, work is not degrading, but noble and sanctified. The Deity is the most active, untiring, and powerful of workers. Nature, God's handiwork, is never still. The entire creation—and not only this, but other orbs—the air, earth, and sea, constitute a scene of ceaseless activity while performing their Maker's will. And although "there remaineth yet a rest for the people of God" (Heb. iv. 9)—a promise from which we may infer, that in the next world we shall suffer neither worry nor fatigue—we shall not be idle even there, but ever at work: work "to a nobler issue" will then be our delight. Therefore, while here we should not be idle. Man, the most highly-developed creature in this earthly creation, and in whom alone the spiritual is blent with the material, is specially fashioned for work; the hands made for mechanical action, the limbs for conveyance to it, the brain to plan, and the muscles to perform it. An idler is therefore an anomaly in creation. Complete idleness is never met with, least of all in the human body. Even when asleep, and apparently at rest, circulation, respiration, digestion, secretion are constantly going on. The brain, too, is ever busy, by night and by day; and if not judiciously, is apt to be unsatisfactorily employed.

The ordinary action of muscles, nerves, brain, glands, and other bodily organs, even the bones, involves a waste ; either of their own particles, or of food and oxygen, purposely stored up in the tissues, or the blood to enable them to carry on their several functions. This constant waste, is met as fast as it occurs, by fresh supplies of air and aliment, so that the body does not wear out, but is kept about its normal standard, as regards size, weight, and energy, whatever be the amount of activity to which it is subjected. But the body, and its different organs are meant to be used, and not to be kept perfectly still, or excused from work, lest too much waste be thereby occasioned. On the contrary, experience shows that it is when kept in a state of inactivity for any length of time, that this waste occurs, even though amply fed. The shrunk and weakened limbs of the fanatical *Fakirs* of India, furnishes an example of this. While inaction is thus detrimental, moderate exercise, on the other hand, is not only beneficial but necessary. The exercise which increases the renewal of tissue, and thereby the reconstruction of the frame, promotes its health and prolongs its life. Under judicious exercise, the body and its several organs and parts, instead of wasting and decreas-

ing, actually grow in strength and size; which proves that this is beneficial, and indeed necessary to health. Without exercise, the human frame, especially the organs of animal life, namely, the muscular and nervous systems, would wither, weaken, and ultimately end their thereby shortened career; whereas, under judicious exercise, we become stronger, healthier, and longer lived.

Moderately active work is salutary; it is only when it is prolonged, and exhausting that it becomes detrimental—owing to the waste of tissue being then more rapid than its renewal. Nevertheless, idleness is oftener a curse, both to individuals and nations, than heavy labour would be. When possible, both extremes should be avoided. As creatures, made after God's image, it is only when engaged in health-giving work, that man most resembles the ever-busy Creator (Gen. ii. 2; Psalm cxi. 2; Job xxxvii. 14) and the equally active Saviour (John xvii. 4, iv. 34, v. 17, ix. 4, v. 36). Our frequent craving for work, when in a proper frame of mind, indicates its suitability and healthiness; and the innumerable forms of recreation, which nature has so lavishly strewn around us, and our varied capacity for different kinds of exercise, indicate that it is not only a natural, but

also a beneficial instinct. The earth, the sea, and the air furnish ample change, and inexhaustible opportunities for its indulgence; and in a thorough acceptance of the boon, we find not only enjoyment, but also health, strength, and long life.

If the curse of labour incurred by our first parents, that "in the sweat of thy brow shalt thou eat bread" (Gen. iii. 19), fell equally on the race, and every person had to labour at some occupation, for a living, each of us would have exercise enough to keep the body in a satisfactory state of health; but this part of the primæval curse is not universally distributed; for though the largest part of the world's population always has, and always will consist of the labouring classes, there is still, as with the nobles in the days of Hezekiah, a large number who never "put their neck to the work" (Neh. iii. 5), and who have little mental or physical exertion, but lead an easy, indolent, and often luxurious life—and for such the voluntary labour which we style "exercise" or "recreation" is absolutely necessary for health; hence the value of its different forms,—athletics, calisthenics, gymnastics, and other sports of the not too barbarous and brutalizing kind, which bring all the muscles

of the body into play, and furnish both exercise and amusement.

It has been found that judiciously conducted exercise, and recreation materially assist the mental, as well as the physical, development of the young ; while they give vigour, suppleness, and health to the adult, and strength to the weakly frames of all ages. This is daily proved by a wisely-selected course of training ; under which the muscles grow strong and wiry, the chest expands, the appetite, strength, and health improve, the brain thinks more clearly and justly, the various organs of the body perform their functions more satisfactorily, mind and body grow more elastic and buoyant, while threatened disease is often warded off. An official inquiry into the results of gymnastic exercises, instituted at a military school in France, over a period of six months, has established the following facts: *first*, that the muscular force is increased on an average from fifteen to seventeen per cent., and occasionally from twenty-five to thirty per cent. ; *second*, that the force has a tendency to become equal on both sides of the body, thus making it symmetrical ; *third*, that the capacity of the chest, and consequently the breathing power, are increased by one-sixth at

the lowest ; *fourth*, that the weight of the individual is increased from six to seven per cent., and occasionally from ten to fifteen per cent. ; while the bulk of the body is diminished ; thus showing that the profit is confined to the muscular system, while superfluous fat is removed. To the upper, and middle classes of society, systematic exertion, such as is pleasurable, and not prolonged to over-fatigue, is an invaluable means, not only of preserving health, but also of prolonging life. The heavier work of the mechanic, and the labourer, on this side of exhaustion, likewise contributes both to happiness and health. And experience proves, that among all classes, rich and poor alike, idleness is not only irksome but weakening, and ultimately both disease-inducing and life-shortening.

Moreover the healthy activity of the body and brain are closely allied. A strictly healthy frame of mind is almost incompatible with a weak or sickly body. As a rule, the mind is permanently most vigorous when the body is strongest. And the reason is obvious. The brain is merely a part and organ of the body. Whatever affects one, influences the other. Noted muscular activity and great brain power are often allied. And

among all people, savage and civilized, those who exercise daily are, as a rule, not only the healthiest and longest lived, but also have the strongest and best-balanced minds. At the same time dissimilarity of work should be studied when possible. Even among labourers, strictly so called, a lengthy continuance of the same kind of exercise is not only irksome, but detrimental both to mind and body; while a change to another variety, even one which is equally arduous, is a pleasant recreation; it relieves the tired muscles, nerves, brain, and other organs, and is therefore judicious. So also mental exercise and exhaustion, often harder and more trying than physical, are best relieved by change of study.

Very little is said directly in the history of the Israelites, or the Bible generally, regarding exercise and recreation. This, doubtless, arises because, *first*, they were frequently moving, which necessitated a considerable amount of work in tent and tabernacle pitching, camp cleaning, and so forth; *second*, their priests and Levites had enough exercise in connection with the numerous sacrifices, offerings, and tabernacle work; *third*, although in the dry, sandy, or rocky desert, there were few opportunities and inducements for pure recreation;

their health was specially protected without it. Still, the Bible does tell us, as it did them, in strong language, that work and recreation are not only good but necessary. And it does this not only by showing their advantages, but also by indicating the disadvantages of the besetting sin of idleness. Mental and bodily labour, when mentioned, are invariably praised, and therefore by inference recommended; which proves that they are good, not only for our worldly prosperity, strictly so called, but for health; while the converse, or laziness, is invariably blamed, thereby showing that it is detrimental. And clearly, if labour and exercise are good, the minor form, in which we indulge for amusement—viz., recreation—must be equally salutary.

Many Bible texts might be cited, which approve of judicious mental and bodily work, and show that it is beneficial in a physical, as well as in a business point of view. God commands us to work (Exod. xxxiv. 21), which shows that it is good for us. He rewards labour, by making the sleep of the labouring man sweet (Eccles. v. 12), and also healthy, for the "labour of the righteous tendeth to life" (Prov. x. 16). Diligence in business is meritorious, and invariably praised and

blessed by God, both for time and eternity (Prov. x. 24, xii. 23, xxii. 19, xvi. 3, xvii. 4; Eccles. v. 18, 19; 2 Chron. xxxii. 30; 1 Thess. iv. 11; Deut. xv. 10, ii. 7). The Bible enjoins every man to enjoy the good of all his labour, as it is the "gift of God" (Eccles. iii. 13). Sanctified labour is certain of reward; for "seest thou a man diligent in his business, he shall stand before kings" (Prov. xxii. 29). The labourer is worthy of his hire and his food (1 Tim. v. 18; Luke x. 7; Matt. x. 10). And Heaven will bless the work of man's hands (Job i. 10).

On the other hand, that mental and bodily idleness, laziness, and sloth are hurtful, invariably disapproved of, and threatened with punishment, is shown by many texts (Prov. xxxi. 27, vi. 9, x. 26, xiii. 4, xx. 4, xix. 15; Eccles. x. 18; 1 Tim. v. 13; Rom. xii. 11; 2 Thess. iii. 10; Heb. vi. 12; Matt. xxix. 26). The penalty is not only of a worldly nature, like poverty (Prov. xx. 13), but also of a more serious kind, namely, loss of health. Thus, "Go to the ant, thou sluggard, consider her ways and be wise" (Prov. vi. 6-9), contains both a warning and advice. Mankind generally should be "not slothful in business" (Rom. xii. 11). Solomon hated this

vice, and always speaks of the sluggard with great contempt (Prov. xii. 27, x. 26, xxii. 13, xviii. 9, xxvi. 13, xvi. 24).

The amount of ordinary bodily and mental labour, or of their minor forms, exercise and recreation, necessary for, or consistent with health, is not mentioned in the Bible, because no fixed law can be laid down for either, as this varies with individual strength, constitution, and other circumstances. What the labourer, or the man of busy brain calls recreation, may be considered hard work for a more delicate person, and so forth. So that now, as then, the amount is left to our own decision, based on common sense and experience—on the supposition that each will individually, and as a duty, take the necessary amount, and avoid idleness on the one hand and overwork on the other, remembering that it is possible to take too much, and even still more easy to have too little. From the latter, result laziness, corpulency, and sundry bodily and mental affections; while over fatigue of body and brain, and even more serious consequences, follow the other. So that it is wise to aim at a happy medium.

The kind of labour, exercise, or recreation, is

also left to personal preference. Tastes differ in this as in other matters, and each one selects according to individual necessities, circumstances, and surroundings. The choice is ample; and between boating, walking, riding, driving, running, wrestling, fencing, swimming, and other forms of exercise in common use, there are few persons, however fastidious, who cannot be agreeably suited. For women, walking is healthier, as a rule, than driving; and nothing suits them better than gymnastics and swimming. The latter, judiciously conducted, not only exercises the muscles, but is the best of tonics for the skin and body generally.

As with individuals so with nations. As a rule, those which are physically weak are also inferior mentally. The prosperity and the future of a nation depend much on the physical and mental health of the individuals who compose it. The physically healthy and mentally enlightened hold their ground best, and ultimately come to the front in the struggle for existence and survival of the fittest; not those that are intellectual alone, but those in whom there is a judicious combination of both. Highly enlightened, but physically weak nations, in which the brain is developed at the expense of the body, are likely to die out or

to succumb to physically stronger races. So, also, physically well developed tribes may be crushed by others that have a higher degree of enlightenment, and thereby greater skill in traffic or in war.

The most heroic people of ancient times, such as the Greeks and the Romans, made their manly sports a national event. Public places were set apart to enable all to indulge in this luxury. Their soldiers also practised these games much, to improve their strength and activity. And modern experience shows that, as with soldiers and sailors, so the physique of private citizens is kept at the highest standard only by the constant practice of athletics, gymnastics, and manly sports. Nations and communities are therefore wise that afford all, and especially the working classes of both sexes, who most require it, and have both least time and fewest opportunities for gratifying the desire, facilities for voluntary recreation and exercise; that provide public squares, gardens, and parks for walking; and with gymnasia, rinks, baths, skating ponds, play-grounds for children; give facilities for racing, boating, swimming, and so forth. Diversions like these should be encouraged, and if necessary judiciously enforced by wise

legislation, especially among the young, and wherever no natural desire for it exists. Private and public health, vigour, and longevity may thereby be greatly increased, and disease and mortality largely diminished.

CHAPTER VIII.

SLEEP.

MAN cannot be always at work. The different tissues, organs, and functions of the body require rest, especially the ever-busy brain, which controls, regulates, and correlates all that we think, say, or do ; and its appanage, the system of nerves by and through which that organ acts. In the midst of hard mental or physical labour, nature warns us by a sense of weariness that we must intermit this by intervals of repose. And if we then leave off for a time, the lull refreshes and fits us for further work ; and we return to our avocation, whatever that may be, with renewed vigour.

But this is not enough. God has so fashioned us that our bodies periodically require the more complete rest which we call *sleep*, "tired nature's sweet restorer," during which we live a passive, semi-vegetative life ; and has so ordained that the desire for this should come when the earth is

shrouded in night and animate creation still. Thought, feeling, and motion are then in abeyance, the body at rest from its toil, the brain from its workings, and the heart from its troubles. In this mysterious process, not only the brain and nervous system, that is the organs which are chiefly involved, but every organ and molecule in the body partake more or less. The heart beats more softly, the lungs breathe more lightly, secretion goes on more slowly; the muscles and the different organs of special sense are all stilled; the lull being so general and complete that sleep has been poetically called the "death of each day's life."

The necessity for sleep and rest is universal in the world of life. For this, the growth and the functions of plants are partially checked at night. For the same purpose the vegetable world also has its longer winter repose. All animals, both the least developed and the most highly organized, require sleep or hybernation, the process which corresponds to it. The necessity for periodic rest is one of the most important laws which govern the health and life of the human body.

As with work so with sleep—the amount best suited for health varies with circumstances. As

a rule, and for an obvious reason, namely, to recruit their strength, labourers require more than inactive or indolent people; males more than females—because they work and think more; children than adults—to assist growth. From five to eight hours a day is the allotted range. Some naturally require more and others less. Night is the natural and therefore best time for sleep. Broken rest, and especially deficient or omitted sleep, are detrimental to the brain and nervous system; and through them to the entire body, which cannot long remain in health. Over-fatigue also wears out the system, unless we give the body an opportunity to recover from it in the appointed manner.

But even this nightly sleep does not wholly suffice. It is also necessary to rest from mental toil and bodily labour every seventh day. The Sabbath was specially made for man (Mark ii. 27). The Hebrew word *Sabbath* means *rest*, and to this the modern *Sunday* corresponds. Most civilized nations take a weekly rest—to recruit from the fatigue of the previous six days; and experience proves that this has several advantages, and is not only morally and spiritually beneficial—doubtless the main object for which it was

instituted,—but also physically good for the body and practically advantageous to business, as the refreshed frame returns to the latter with new zest, able to work longer and with greater vigour. The result of a non-acceptance of this weekly boon is exhaustion of body and soul, and ultimately physical and mental disease. From personal sanitary motives therefore, as well as from the love we bear, and obedience we owe to God, we should keep the fourth commandment strictly, and abstain from all unnecessary work on the Sabbath day. When nations habitually break this law, they not only tempt Him to anger, but court disease. And this is doubtless one, and perhaps the main, cause of the failing prosperity and diminishing health of Sabbath-breaking countries.

The various forms of rest and sleep are frequently spoken of in the Bible, and in strong language. Our natural and constant desire for both, in this world of physical bustle and mental worry (Psalm lv. 6) is indicated in the comforting promise of the complete “rest” that is to characterize the future state (Heb. iii. 9). Man requires rest, like the Maker in whose image he was made (Gen. ii. 2). And that the law is made for the body as well as for the soul is

shown by the fact that rest is as necessary for the lower animals as for man (Exod. xx. 10); and even for the inanimate land (Lev. xxv. 4). The object in enforcing it for man, beast, and soil alike, was to prevent mental, corporeal, and physical exhaustion, and permit complete recuperation of their exhausted energy.

The majority of the Bible hints regarding rest, speak of its worldly advantages when properly regulated, and the disadvantages of the reverse; but its effect on health is also clearly included. This is proved indirectly by the texts which praise it, and show that it is not merely a pastime or a luxury, but necessary and beneficial for the mind and body as well as for the soul. Rest is one of the rewards promised for faithful service to God (Deut. xxv. 19). It is the gift of love (Psalm cxxvii. 2), and the sure reward of labour (Eccles. v. 12). Rest is a beneficial and indeed necessary blessing (Isa. xxviii. 12, lvii. 2; Psalm lv. 6, cxxvii. 2; Prov. iii. 29; Eccles. v. 12; John xi. 13, xii. 24; 2 John iii. 13); while want of it is considered injudicious (Matt. xii. 43); and its deprivation deemed disastrous (Prov. iv. 16; Psalm cxxxii. 4; Dan. vi. 18).

On the other hand, over-indulgence in this en-

ting luxury is blameworthy (Prov. vi. 9, 10; Isa. lvi. 10). The Bible corresponds with nature and experience in indicating that night is the best time for sleep (1 Tim. iv. 7); but for the above-mentioned reason it does not specify the quantity required either of this or of ordinary rest, and only indicates that we ought to have enough, though not too much. In short, moderation is inculcated in this, as with all other necessities, desires, and luxuries. An unconquerable desire for rest usually comes when we are tired; and, as with the appetite, the longing for sleep returns at periodic intervals when the body requires it. There is no necessity for the Bible enforcing this natural law by actual command, seeing that we are more likely to err on the side of somewhat too much, than of too little sleep, or none at all. But it is different with the seventh day, or Sabbatic rest. To most, and especially to business people, the necessity for this is often not so apparent. If left to the cupidity or thoughtlessness of other individuals, we might frequently be made to work on every one of the seven days of the week. God, however, has prevented this by the law which enjoins rest on the seventh day; a commandment obviously meant not only to give opportunity for closer com-

munion and walk with God, but also, and doubtless greatly, to refresh the frame by a cessation from physical work, and enable it to return to "the daily round, the common task" with renewed zest and vigour.

Attempts have been made to prove that the Sabbatic rest is not binding in modern days, and is neither a necessary nor permanent ordinance, but merely a temporary arrangement for the Israelites. But the Bible itself proves that there was an artificial division of time into weeks long before the Sinaitic law was given (Gen. viii. 10, xxix. 27, 28). Moreover, all ancient nations, not the Jews only, but others, to whom the *law* was not specially delivered, who probably knew nothing of it and of the Bible; or despised them as Israelitish—for example, the Assyrians, Egyptians, Greeks, Romans—divided their time into periods of seven days, which is clearly a relic of the Edenic dispensation, and of Adamic times. Besides this, the terms in which the Sabbath Day is spoken of in the fourth commandment, thus, "*Remember* the Sabbath day to keep it holy," shows that it was not a new law given them for the first time, but merely the revival or rather renewed inculcation of a well-known and long-instituted ordinance, doubtless

originally given to our first parents in Eden. The law forbidding the gathering of manna on the Sabbath, and rendering this practically unnecessary by a special double provision on the previous day, was given before the Sinaitic promulgation of the ten commandments (Exod. xvi. 5). And so, also, we find that the Israelite was stoned to death for gathering sticks on the Sabbath before the Decalogue was given; showing that this Sabbatic ordinance, and doubtless the whole of the ten commandments, or at least the spirit of them, were known and followed from the earliest times. Again at a later day, Christ spoke of the Sabbath as an ordinance meant to be continued (John xx. 19, 20), and He specially sanctified it, as did the Apostles and also the primitive Christians (Acts xx. 7; 1 Cor. xvi. 1, 2).

In order to reconcile conflicting opinions some modify this, and hold that every day should be a Sabbath as regards fellowship with God. And in a sense it is decidedly true that mankind should be heavenly minded, not on the Sabbath alone, but at all times. Still, God's decision on the subject, as given in the fourth commandment, should clearly form our rule of conduct. The boundless love and knowledge of our Creator knows what suits us best. And therefore, we should strictly set apart

this special day, not only for soul refreshment, but also for physiological rest of body and brain. As a landmark to be kept in commemoration of God's rest from creative work (Gen. ii. 2), as a special sign of a covenant with our Maker, and in its modern form of Sunday, a special reminder of Christ's work of redemption, it is evidently unwise to disobey, and thus practically annul, the command (Exod. xxxi. 12, 13).

But besides this seventh day's rest, the Israelites were commanded to let the land lie fallow every seventh year (Lev. xxv. 4). This—the last of a week of years—was called the Sabbatic year; and was meant to rest not only the land but also the body and brain of the husbandmen. It was good for the soil—"For then shall the land enjoy her Sabbaths as long as it lieth desolate" (Lev. xxvi. 34-43). Curiously enough, modern farmers likewise find it profitable to let their fields lie fallow every seventh year, the yield of the following season being usually greater. And, no doubt, if business men, especially those of unusually active nations, like America, would occasionally let body and brain lie fallow in this manner, they would find it beneficial in more ways than one. The importance of this Israelitish ordinance is forcibly shown

by their later history. As they forgot God they progressively neglected to keep the Sabbatic year. But the omission was specially punished ; for when carried into captivity they were kept thus till the debt of years was paid up (2 Chron. xxxvi. 21).

But again, the Israelites were further commanded to give their land an additional rest by letting it lie fallow one year after every forty-nine. During this, the fiftieth year, Sabbath of years, Sabbath of the land, or year of Jubilee (Lev. xxv. 10), they neither sowed, reaped, nor gathered any of the fruit which accidentally grew. The effect of this corresponded to that of the seventh year's rest, and not only benefited the exhausted land, but also eased the physical toil of the husbandmen, hired servants, maid servants, strangers that sojourned with the people, and also the cattle and other animals. Might not a similar observance be equally beneficial in modern agriculture?

In addition to all this, the Israelites had special days of rest, connected with their particular mode of worship ; for example, at the Feast of Trumpets (Lev. xxiii. 23) ; at the Feast of Atonement (Lev. xxiii. 30) ; and at the Feast of Tabernacles (Lev. xxiii. 26). These periodic rests are

clearly not so binding on us in modern days. At the same time they strengthen the position we have here taken, and show that the rest so often mentioned in the Bible in connection with the Sabbath, is for the benefit of the body and brain as well as for the soul, and in short, physical as well as spiritual.

These remarks regarding rest, are clearly as applicable to families, communities, and nations as to individuals. It was necessary for the temporal welfare of the Israelites ; and disastrous if withheld, being promised as a reward and a blessing (Deut. xxv. 19 ; Joshua xxi. 44), and they were deprived of it as a punishment (Deut. xxviii. 65-67 ; Isa. lvii. 20). And history proves that it is the same in modern times. Working people in the mass may be over-driven. Nations which are over-busy in commerce, and especially in war, and who never relax their mental and physical efforts, ultimately suffer for it. So also societies, communities, and so forth, that turn night into day, and spend the night in revellings instead of repose, and especially those who forget the Sabbatic day of rest, are punished with as much certainty as the individual transgressor.

CHAPTER IX.

CLEANLINESS.

THE human body is constantly being contaminated, and that in various ways. For example, it defiles itself, so to speak, by the perpetual tissue waste that is going on all over the body. The refuse so produced is thrown out of the system by the different excretory organs. Of these the skin is one of the most important. And by nothing is the frame apt to be more defiled, or oftener sullied outwardly, than by the perspiratory and fatty matters excreted by the innumerable minute sudoriferous glands which everywhere bestud the skin, and the small particles of cuticle which are constantly scaling off from its surface. Moreover, the body generally, and especially the skin, is constantly befouled from without ; for example, by the dust which floats in the air, and also by unavoidable contact with the material objects that surround us in our homes and places of business, as well as the

matter thrown off by the various processes of cooking, trade, manufacture, street cleaning, and so forth.

Hence arises a necessity, incumbent on all, old, young, rich and poor alike, for frequently purifying and keeping the skin clean by daily, and sometimes more frequent ablution of the entire surface, especially the hands, head, face, neck, feet, and other exposed places. The popular maxim, "Cleanliness is next to godliness," is a public recognition of a belief in the great truth that this is one of the most important laws of health. Working people obviously require more thorough and frequent ablution than those who lead an idle life. For ordinary purposes the cold bath (45° to 55° Fah.), or the temperate bath (55° to 65° Fah.), are convenient, and not only purify the skin, but stimulate it, promote its function, and thereby give tone and health. The need for frequent ablution is obviously greater in warm than in cold and temperate seasons and climates, because the skin acts more freely; and there the cold, fresh, or salt water bath becomes a positive luxury. It is impossible, however, anywhere or at any time to be too pure in person; and the necessity for aiding this by frequently

changing our clothing, especially our inner garments, really worn as much for cleanliness as for warmth and decency, and also for supplementing it by thorough cleanliness of our dwellings, and anything else by which we may be contaminated, are equally apparent.

Want of cleanliness soon becomes evident and obnoxious both to ourselves and to others, and what is worse, the skin gets coated, its pores clogged, and its functions as a breathing and excreting organ interfered with. Noxious matters which ought to be excreted are thereby retained in the blood, and thus various diseases not only of the skin itself, but of other parts, and especially of the glands which have then to aid the cutaneous surface in performing its function, and may thus become overtaxed, are apt to ensue. When we recollect that the skin helps the liver and lungs to excrete carbon, and *vice versa*, also aids the kidneys and lungs to throw off water, and likewise assists the intestines to excrete salts, it will be easily understood why it happens that by coating the skin with varnish so as to stop its function, the person would soon die, an experiment which has been performed on the lower animals. And this is exactly what we do in another and minor

manner when we neglect to bathe or wash. So that, other things being equal, the cleaner the skin, so much the healthier, clear-brained, and longer-lived we become.

We may generally judge of the importance of any sanitary subject by the frequency and force with which it is alluded to in the Bible. The Scriptures often speak of the necessity for personal and public cleanliness, and lay great stress not only on having a clean heart, that is, on being morally and spiritually pure, but also on physical cleanliness, that is, purity of the body, garments, houses, and so forth. Whole chapters in Numbers, Leviticus, and Deuteronomy are devoted to the subject of cleanliness of the person, clothing, tents, tabernacle, and camp, which the leaders, chief priests, Levites, and Israelites generally were bound to observe. All through both Testaments the importance of cleanliness is either directly or indirectly alluded to; and though in many places personal cleanliness is alone spoken of, the text clearly inculcates purity in all things, in thought, word, and deed, and not of the heart and life only, but also of the body and the clothing. Such stress was laid on purity, that it even makes a distinction between clean and unclean animals (Lev.

xi. ; Deut. xiv.). God's great purity is often spoken of as an example to us ; even the heavens are not clean in His sight (Job xv. 15). The removal of sin is spoken of symbolically as a process of washing,—“The blood of Jesus Christ cleanseth from all sin” (1 John i. 7). And again in the passage “Wash you, make you clean” (Isa. i. 16), we find spiritual typified by physical purity. And significantly enough water is the biblical symbol of cleanliness, and personal the symbol of moral purity (Isa. i. 16 ; Ezek. xxxvi. 25 ; Matt. xxvii. 24 ; Psalm lxxiii. 13).

Again, the Bible tells us that in ancient Israelitish times God required that those persons and things which ministered to Him, and thus became a medium between Him and the people, should be clean. Thus Aaron and his sons, and subsequently the high priests, had to be washed with water before they were consecrated (Exod. xxix. 4). They were also commanded to wash their hands and feet before sacrificing, and even before entering the tabernacle. The Levites had also to shave, wash their clothes, and clean themselves before their consecration (Numb. viii. 7). Even the altar had to be cleansed and anointed to sanctify it (Exod. xxix. 37). The cleansing of the Temple was also

considered an important matter (2 Chron. xxix. 16), and its non-cleansing a source of regret (Dan. viii. 14). Church purity was symbolized in Apostolic times by washing with water (Ephes. v. 26).

Personal cleanliness is always spoken of in the Bible as a luxury, and to have opportunities for it as a great boon (Matt. x. 8 ; Luke xvii. 7). The necessity for washing the entire surface of the body is clearly indicated in the Bible (John xiii. 10 ; Ezek. xvi. 4), and also figuratively alluded to (Heb. x. 23 ; Ezek. xvi. 9). Washing of the hands and feet, both much exposed, and the latter only sandal-clad in the East, are frequently alluded to. It was and still is a mark of hospitality there to offer this (Gen. iii. 24, xviii. 4 ; Judges xix. 21), and a slight to withhold it (Luke vii. 14). There was no higher mark of esteem in the East than for a host to wash a friend's or guest's feet himself (Luke vii. 38 ; John xiii. 5 ; 2 Sam. xi. 8). The Pharisees never ate with unwashed hands (Mark vii. 3), a very good rule for people of every clime and period, when not followed pharisaically. Watson tells us that in Christ's time, as the law enjoined ablution (Lev. xv. 11) after a person had touched anything ceremonially unclean, the excessive formalism of Jewish teachers had imposed this ablution wherever there

was the least possibility of defilement. Thus, on sitting down to meals, the individual rinsed his hands, and even washed himself more carefully after returning from the "market"—that is, the place of public concourse. Thorough ablution of cups, vases, brazen vessels, and dining couches was also required. The later Jews even directed that the framework of couches should be taken to pieces and dipped. By this punctilious washing, especially of the hands, the Pharisees distinguished themselves not only from the heathen, but also from "men of the earth," as they called the common people of their own nation. So also cleanliness of the hair and nails is inculcated by the frequency with which the Israelites of old washed the head and hands. They also shaved the former to avoid scab and other cutaneous eruptions, which according to the Scriptures were very prevalent and difficult to cure. They did not possess such a copious water supply in the wilderness, and even in Judea, as we have, to enable them to keep the head clean by washing it after cutting the hair short. Washing the hands and mouth after meals, a common custom among ourselves, was especially necessary among the Israelites of old, as they carved and ate with their

fingers. So also cleanliness of the teeth is indirectly praised in the Bible (Amos iv. 6). Moreover, especial purity of the person is enforced after certain seasons and occurrences (Lev. xii. 1-8).

Purity of the clothing is also enforced by Bible precept (Gen. xxxv. 2; Exod. xix. 10-14). This was especially necessary, seeing that the Israelites often slept in their day garments, or made only a slight change (Exod. xxii. 26, 27). In the East at the present day the *hyke* or cloak is often the poor man's only covering, and even bed at night. Clean clothing is often recommended symbolically (Rev. vii. 14, xix. 8-14), and is frequently indirectly praised by contrasting it with filthy garments (Zech. iii. 3; 2 Sam. xix. 24).

The Bible also encourages cleanliness of household utensils (Mark vii. 4). And although this rule was largely Pharisaic, it was and still is judicious in a sanitary point of view. Cleanliness of the Israelitish tents and camps is also frequently mentioned, thus showing the great stress laid by God on general purity.

The whole of a lengthy chapter in the Pentateuch (Lev. xv.) consists of special laws inculcating purity of the person, bedding, clothing, etc., of both sexes, particularly when afflicted with loathsome diseases:

ver. 31 is the sum, substance, and practical aim of the whole,—“That the Israelites die not in their uncleanness.” The uncleanness here alluded to is evidently twofold,—not only actual, but also symbolic, of soul as well as of body. These laws were also applicable to the priests (Lev. xxii. 4-6), and it was their duty, and that of the Levites, to see that the people carried them into effect (Deut. xxiv. 7, 8).

But nothing shows better not only the facility with which these, and especially the body, may become defiled in the most unexpected manner, the constant care necessary to avoid this, and above all the great importance of personal cleanliness, than the minuteness and stringency of the Israelitish rules for keeping or freeing individuals, their clothing, houses, etc., from pollution. Thus, an Israelite was considered unclean for seven days after touching a dead body (Numb. xix. 11), and commanded to purify himself on the third day. This rule was meant to prevent unnecessary or superstitious practices with the dead common among other nations, to ensure speedy burial, to inculcate personal cleanliness, and to prevent the spread of infectious or contagious diseases. Even if a death occurred in a tent, all who entered this,

and every open vessel therein, were considered unclean for seven days (Numb. xix. 14). So also, even if a person touched a slain body in a field, or merely the bone of a dead person, or a human grave, he was thereby defiled and considered unclean for seven days. The same penalty was incurred even if he touched any of these second-hand—that is, through another person or thing (Numb. xix. 16).

These rules, moreover, extended to the priesthood. If a priest was leprous, or unclean from a running issue, or from touching any unclean thing, person, dead body, or creeping thing, he was enjoined not to go unto the holy things, or to eat of them, till he was clean (Lev. xxii. 4-6). The penalty for disobedience was that his soul was to be cut off from God's presence (Lev. xxii. 3). This law was clearly meant to increase their reverence for God's holiness. So also, in order to still further inculcate the habit of purity in all, but especially in holy things, the flesh of a peace-offering which touched any unclean thing was not to be eaten, but to be burnt with fire (Lev. vii. 19), under penalty of the transgressor's soul being cut off from his people. Again, the flesh of the peace-offering was not to be eaten by anyone who had

become unclean by reason of personal impurity, or by touching an unclean person, beast, or thing. The same penalty was incurred by disobedience. After the first Midianitish war, whoever killed any of the enemy, or even touched the slain, had to be purified on the third day *out of the camp* (Numb. xxxi. 19), and were deemed impure for seven days; while their woollen, hair, or skin garments had also to be purified, and every gold, silver, brass, iron, tin, or leaden article in their possession had to be passed through the fire, and then sprinkled with the water of separation. On the seventh day their clothes had to be washed.

The mode of *purification* here spoken of consisted in a clean person taking the "ashes of purification" and running water with hyssop, and sprinkling them on the seventh day, then bathing the body and washing the clothes. The sprinkler had afterwards to wash his own clothes. The water of separation or purification was formed by mixing in spring water the ashes of a heifer, sacrificed probably as often as a fresh supply of ashes was required, together with other ingredients (Numb. xix. 6). It is said that after the Israelitish settlement in Canaan, some of the ashes were kept in every town. It is clear that they must have

been often required, as it is impossible for a burial to take place without someone touching the body. After burning the heifer to obtain its ashes,* the priest who did this, and also the man who gathered the ashes up, were both required to wash their clothes and be unclean till even (Numb. xix. 8-10).

These Jewish ordinances, besides being instituted to keep them from defilement by inter-marrying with other nations, had doubtless a symbolic meaning, and were imposed to promote spiritual purity. But that they were inculcated to foster personal cleanliness is also evident.

Cleanliness is clearly of as much and often of more importance to us than to the Israelites of old, seeing that their bodies, tents, houses, and so forth were less apt to get defiled than ours by smoke-polluted atmospheres, dusty streets, and dirty trades. And their health laws regarding cleanliness, though not in one sense binding on us, are in their spirit and tenor, when modified

* By this process of lixiviation an extra value is also given to sacrifice as a substitution, for it not only indicates the purity imputed, but also a greater purity imparted, the washing being made more potent literally as well as significantly by the alkali, the basis of soap present in the ashes in the water, the chemical knowledge of which Moses inferentially possessed.

to suit the age in which we live, as good for the maintenance of our health as for theirs.

In addition to the above-mentioned general laws, the Bible gives various important special rules regarding cleanliness of the person, clothing, camp, and so forth, during the presence of infectious disease. These, however, will be more appropriately discussed under the head of disinfection and disease prevention than here (Chap. XV.).

CHAPTER X.

CLOTHING.

CLOTHING has a threefold object: *first*, to cover the body; *second*, to keep it clean; and *third*, to protect it from atmospheric vicissitudes, from the warmth of some and the cold of other seasons or climates to which it may be exposed.

Both comfort and health require that the body should be at all times and everywhere kept at a suitable temperature, neither too hot nor too cold. The exact range varies with individual peculiarities. To effect this, heavier, thicker, and tighter clothing is necessary in cold and temperate than in warm regions. As a rule, active men and busy nations require more closely fitting garments than women; not so much to lessen or to increase heat as to facilitate their movements. Again, in warm latitudes, personal cleanliness necessitates a frequent change of clothing, especially that worn next the

skin; while health purposes make the use of certain kinds of material judicious, both in warm and in cold latitudes; thin linen, cotton, and silk being most suitable in the former, and thick woollen and furs in the latter.

No pointed advice, but merely such as is suggestive, can be found in the Bible regarding the material of which we should make our clothing, because, so long as we do get suitable stuff, the kind is comparatively unimportant. The first clothing mentioned in Bible times consisted of leaves sewn together (Gen. iii. 7). Skins, probably those of animals used in sacrifice, subsequently girded Adam and Eve (Gen. iii. 21). We afterwards read of woollen and linen (Deut. x. 5, xxii. 11, 12; Psalms ix. 2, xlv. 7; Dan. x. 5, xii. 6; Rev. xv. 6); and then of camel's-hair clothing (2 Kings i. 8). At the present day the busy world-circling commerce of modern times by bringing commodities from all quarters of the globe enables us to have a greater variety than had the Israelites. The chief materials now employed are cotton, linen, jute, wool, silk, hair, leather, and indiarubber.

Nor can much sanitary information be gathered regarding the most suitable make of our clothing.

As this is, in one sense, a matter of comparatively little importance, it is mainly left to individual or national taste, custom, and convenience. The clothing of the Israelites was light and loose to suit the warmth of Canaan, Arabia, and Egypt ; and also to facilitate their habit of sitting, or rather reclining, at meals on the ground or on low mat- or rug-covered couches or divans. This fashion was also healthy because they often slept in their day garment, and looseness favoured ventilation, coolness, and cleanliness. Our bustling active habits, however, require more closely fitting garments, and in the colder northern States heavier clothing is needed than is necessary in those of their more southern Asiatic latitudes.

The chief mention made of clothing in the Bible is in the form of a tirade against extravagance. Much dress was forbidden the Israelites (Isa. iii. 16 ; liii. 18-23). So also soft—that is, luxurious raiment—was decried (Matt. xi. 8). In the earliest times their clothing was very simple and unostentatious. But as time wore on and they saw or mingled with, and doubtless imitated, other nations, this became more costly and varied ; and it is against this from of folly which the prophet warns. The Bible also admonishes against esti-

mating people socially, morally, and above all, spiritually, by their goodly apparel and gay clothing (James ii. 2, 3). This, however, is clearly not a health hint; at the same time it should never be forgotten that, according to the Bible narrative, dress, in which mankind generally so often pride themselves, is a badge of guilt and a memento of our fall from purity and holiness (Gen. iii. 7). The hint given in Deut. xxii. 5 is a matter of social importance, and especially suggestive in married life.

CHAPTER XI.

MENTAL, MORAL, AND SPIRITUAL CULTURE.

A COMPLETE system of hygiene should aim at something more than merely preserving the health of the body, and should also show how to best maintain the proper mental, moral, and religious standard. The close connection that exists between the operations of the mind and those of the body will be readily understood when it is remembered that the brain, by which the former are produced and made manifest, are themselves organs and parts of the body. In health, the mind, as a rule, acts on the body, and the body in turn on the mind. Whatever influences or injures either influences or injures both. The mind is strongest when the body is most vigorous ; and although instances have occurred to the contrary, prolonged high mental vigour is, in most cases, incompatible with a weak frame or imperfect health. Too much physical exertion depresses

the mind ; too much mental labour enervates the body. Undue excitement of the moral feelings also reacts on the frame ; while overwork of the frame does the same to the moral feelings. And as in health so in disease ; bodily afflictions usually affect the mind more or less ; and so in turn mental affections react on the body. Hence the importance of keeping the balance between them true. From social causes of disease, not only individuals, but also families, communities, nations, deteriorate in health, become liable to mental and physical disease, and also shorter-lived than usual. The downfall of the most highly, physiologically and mentally, gifted nation of ancient times, namely, the Greeks, was chiefly due to widespread immorality. Facts might be adduced to prove these positions were it necessary.

Besides sanitary maxims suited for our physical frame, the Bible gives valuable maxims regarding our mental, moral, and spiritual culture. As the subject is too extensive to be fully studied here—that with which we have to deal being mainly *physical* hygiene—we can only give a few remarks on its moral and psychical department.

The Bible lays down some admirable rules on this subject ; to follow which brings health, long

life, and happiness; while to disobey, induces misery, sickness, and perhaps death. It warns strongly against excessive mental work, thus: "Neither make thyself overwise; why shouldst thou destroy thyself?" (Eccles. vii. 17). Over-study has often induced deadly disease; while many serious ailments, especially nervous ones, and even insanity, have resulted. And even when this deplorable acme has not been reached, many a man has found like Solomon, himself a scholar, that "much study is a weariness of the flesh" (Eccles. xii. 12), inasmuch as it frets and wears the body out, and is especially detrimental to the all-important brain and the nervous system generally. It should be remembered, however, that in all cases, severe mental toil—when unavoidable—is best borne when the diet, exercise, and general hygiene of the body are well attended to.

But on the other hand, under-study, mental inertia or laziness, are also prejudicial and therefore wrong. Imperfect health and inferior mental development may thereby result; while the moral and spiritual culture are also apt to be more or less neglected. The amount of mental labour in which we can safely indulge is clearly left to

our individual judgment and guidance. Some can stand more and others less. Judicious and healthy brain culture is ennobling; and beneficial not only to the individual, but occasionally, to the community and even the race at large; for thought unquestionably "rules the world." But although it is a duty incumbent on all, to cultivate the mind as well as the affections—the head as well as the heart—the relative importance of these two may be gleaned from the Bible—inasmuch as the emphasis with which the Scriptures say—"My son, give me thy *heart*" (Prov. xxiii. 26): while the commanding intellect of the Supreme is never spoken of, at least in laudatory terms, proves that—great and important though the cultivation of the intellect is considered in God's sight—the development of the heart and the affections ought to be the chief object of our concern, next of course to the welfare of our immortal soul, of which indeed it forms a necessary and inseparable part.

The Scriptural warnings against our over-indulgence in certain feelings and passions, are still more strongly expressed. The several appetites and desires that give us pleasure, and in which we are therefore apt to indulge freely, it is our

duty to curb, because they are baneful alike to body, mind, and soul. The observance of this rule should be strict, and should include purity in thought, as well as in word and deed (Matt. v. 28). Our duty is to fully eradicate our evil propensities (Mark ix. 43). If we neglect this, or fail in our effort, disease or disaster may sooner or later follow. The Bible teaching is, that in *all* things we should mortify our bodies and evil inclinations; and that we should curb not one only, but every propensity, passion, and feeling; and that we ought thus to check not only the bad, but even the good ones, seeing that the good and bad ones are alike apt to run riot. Strict heart culture and purity of mind, are everywhere inculcated. Defilement comes not from without, but from within (Mark xvii. 18-23). Others may corrupt us, but not without our consent. We are less defiled by what we eat or by what we touch, than we may be, and too often are, by our own thoughts and words (Matt. xv. 19.) The Bible tells us to keep ourselves pure (1 Tim. v. 22); and also to mortify our members (1 Colos. iii. 5); that is, to destroy and put to death all the habits and lusts connected with hostility to our heavenly destiny.

Paul warns Timothy, then in the prime of life, when the passions are strong, to flee youthful lusts (2 Tim. ii. 22). We should abstain from fleshly lusts and the desires of our corrupt nature, which war against the soul (1 Peter ii. 12; Rom. xiii. 14). The evil longings of our depraved nature attack our higher powers, and often bring judgment, conscience, and imagination under their destructive influence. We should flee impurity because we are not our own, but God's; and bought at the price of Christ's crucifixion (1 Cor. vi. 20). Carlyle has said that whoever lays his hand on a human body touches a piece of heaven; while Paul calls it the temple of the Holy Ghost (1 Cor. vi. 19). Nor should we forget that it lies with ourselves to keep the shrine pure, and prevent it from being desecrated. If we sin, therefore, we sin against our own body (1 Cor. vi. 18, 19), and to our own temporal and bodily detriment. As an aid to purity, David advises frequent self-confession, saying, "Commune with your own heart on your bed, and be still" (Psalm iv. 4).

The subject now under consideration is one of public importance. While private rectitude is necessary for public virtue, both are indispensable

for public health ; and all of these combined are requisite for national prosperity. While physical causes of disease are often removable by State enactments ; the social and the moral ones are not so easily controlled. Much preventible disease is attributable to social causes, which legislative measures or ordinary sanitary precautions do not reach. In such cases we must depend mainly on a personal and public sense of duty. Social questions in modern times are both numerous and often difficult to grapple with.

Man is neither a self-created, nor a self-dependent being, and has no right to impugn God or to question the wisdom of His laws. We are no more permitted to criticise and cavil at our physical or psychical structure, than we are allowed to object to our planetary abode, or our sex, race, and position in life. For "shall the thing formed say of Him who formed it, Why hast Thou made me thus ?" (Rom. ix. 20). Consequently we have no warrant or, justification for, indulging to the utmost, those appetites which He has implanted in us, when told that it is detrimental. Nor, rightly regarded, will these moral restrictions be considered unnecessarily harsh and restrictive, but rather as highly benefi-

cent, and meant for our good. The usual experience of transgressors is that they are so; and also that it would have been well for them that speedier obedience had been effected by earlier affliction (Psalm cxix. 71). Thus looked at, morality is not a blind compliance with dogmas or creeds; or an unwilling obedience of a useless and needless law; but a hearty subscription and submission to the judicious health-laws of an all-wise Creator.

The inference to be drawn from the Bible regarding those feelings, passions, tastes, and impulses is; that some of them, for example, the purely or chiefly mental ones, such as hatred, malice, envy, and so forth, should be curbed, and not indulged in at all (Colos. iii. 8); while others which are more of a physical nature, like eating, drinking, and similar enjoyments, should only be indulged in to a lawful extent, and in moderation. If ever tempted to overstep the bounds of prudence in a matter which involves, not only our duty to God, but also our physical health and spiritual welfare; we ought to make the strenuous resistance which all people are capable of successfully offering, when they choose to try, seeing that no one is tempted beyond his power of endurance

(1 Cor. x. 13) ; and will assuredly be divinely aided in every attempt at self-reform, however feeble the effort (Rom. viii. 26). None are exempt from this constant warfare against sin ; and, with one exception, no one has escaped defilement therefrom (Rom. iii. 10-23) ; and the wounds and downfalls with which Christians are so familiar, and have so often to regret. For who can put his hand on the Decalogue and say he has never transgressed ? The more pure the life, and the more elevated he character, so much the more sensible does the Christian become of this fact. And, aware of his own weakness and imperfection (Psalm ciii. 13 ; James v. 11 ; Heb. iv. 15), so much the more inclined is he, if not to excuse, at least to pity the failings of others, and help them to amend (Acts xiv. 15 ; James v. 17). No one can escape the assaults of sin, or always expect to successfully resist it ; and still less to attain perfection (Rom. iii. 10). But we know that God will accept our constant strenuous endeavours to "overcome" its advances (Rev. xxi. 7), and will pardon all our shortcomings during such sincere efforts for the attainment of that perfect purity (1 John iii. 3), and holiness (Lev. xi. 4-9), and closer resemblance to His likeness, to which all ought to aspire (Psalm

xvii. 15 ; 1 John iii. 2). But love towards God we need neither check nor control. This, indeed, is the only sentiment against over-indulgence in which we are not warned ; and are only cautioned against nourishing too lightly. We may not even idolize our dearest and our best (1 John v. 21); but God we are commanded to love with *all* our heart, and soul, and mind, and strength (Deut. x. 12 ; Matt. xxii. 37). For Him our affection ought to be supreme and boundless. The stronger it is, so much the more pleasing is it to Him ; and so much the better for ourselves, not only for time but for eternity.

On the other hand, the regulation of the morals of a community must be left, as a rule, to individual management and judicious education. Widespread general knowledge of a high order, and a healthy public tone, make the matter one of intelligent public conviction among all classes, especially masters, parents, and other authorities.

The Bible gives many hints regarding the religious training necessary for our welfare. This subject, however, which embraces the most important part of our earthly education, and its results, that have been designated the study of the "life of God in the soul of man," is entirely

out of our present province. But the sum total of the teachings of the Bible closely accords with worldly experience, in attesting that the only way to be, if not permanently and perfectly free from care, at least to enjoy the greatest share of happiness that this world allows, is to be perfectly pure, honest, truthful, and God-fearing. A consecrated hearty obedience to God's moral and spiritual laws, is assuredly the most certain way to induce happiness ; just as a close and steady fulfilment of the sanitary maxims to which these pages are mainly devoted, is the most likely way to preserve our physical health. And as Professor Blaikie, a clear thinker and forcible writer, has it, " If you would be healthy, be good ; if you would be good, be wise ; and if you would be wise, be devout and reverent, for the fear of God is the beginning of wisdom " (Psalm cxi. 10).

CHAPTER XII.

ON PUBLIC HYGIENE.

ALTHOUGH the general well-being and health not only of individuals but of the public at large, is and will always be mainly in their own hands; and depend chiefly on personal exertion and self-restraint; there are circumstances under which private citizens cannot control the necessary hygienic agencies; and others in which they will not attend to them. We do not speak of those cases already alluded to, where individuals are not their own masters, but in the service of others whose duty it is to superintend the hygiene of their households, workshops, factories, warehouses, and so forth; but of those still larger bodies of people that constitute villages, towns, and cities, among whom hygienic circumstances may arise which only the public as a body can deal with. These have to delegate their power to health officers, or local and Government authorities, whose duties are both legislative and executive, and who not

only make sanitary laws, but also carry them into effect. In a wide sense, however, it is the people and their physicians who are the sanitarians; and as such they ought to have a complete knowledge of public hygiene.

Thus, to give examples, the water supply of a town, city, or village may be deficient or polluted; the provision supply may be adulterated; or the houses and streets may be indifferently drained, and the air thereby rendered deleterious. In such cases the health authorities must act for the people and remedy the evil. Or the houses of a city may be fairly ventilated, but a chemical manufactory, an abattoir, or some other nuisance may taint and render the air dangerous. In such cases, where ignorant or stubborn private individuals will not remedy the evil, the local health authorities or the State steps in and compels them. Or, again, the ventilation of a mine may be defective; in which case local authorities or the State enforces an improvement. Or a community may be in danger of the introduction of an infectious disease from some distant place with which it holds intercourse; in which case local governments interfere to enforce a judicious quarantine. Or the health, comfort, and efficiency of armies and navies may

suffer from errors in dieting, clothing, air supply, and so forth: in which case governments superintend and make satisfactory sanitary rearrangements. Or short-sighted, ignorant workmen may themselves neglect sanitary rights, quietly endure wrongs, and object to have their special trade made salutary, lest a living might cause improved health—thereby an influx of operatives, reduced wages, difficulty in procuring a living—and thus interfere with their more immediate personal comfort. Here the only remedy consists in vigorous sanitary inspection and strict health laws.

At the same time it must be remembered that to maintain health, private and public hygiene must go hand in hand. Local sanitation will not prevent disease if private hygiene is neglected. So also careful and universally followed private hygiene will not prevent disease if public sanitation is neglected. For the maintenance of general health, every one of the laws of hygiene, public and private, must be carefully and completely followed.

This branch of sanitary science, which studies the health and physical condition of the masses, is called *public hygiene*. As with private hygiene, it is based on the belief that much of the disease which prevails among mankind, is preventible. The

same hygienic influences which act on the individual for good or for evil, also operate on the public. So that in studying the latter, the food, clothing, air, etc., which so much affect the one, have likewise to be studied. Public hygiene is as valuable and as necessary for the health of communities and nations, as private sanitation for that of individuals. It is a matter of comfort or misery, sickness or health, life or death, to thousands, nay millions, in every community and country. Private and national prosperity, so intimately connected, are both closely allied with public health. How to maintain the latter is thus, for several reasons, a problem of general as well as private importance. It is as wise of nations as of individuals to study health preservation. State legislation therein is of first importance. And in nothing can the shrewdness of any government be better shown than by judicious sanitary legislation; while experience proves that as with individuals so with nations,—those who are the most healthy, vigorous, and longest lived, are those that understand and obey the laws of health, and have the most carefully-regulated public hygiene.

But the great value of public hygiene is best shown indirectly, by the consequences which ensue

when its laws are neglected. When for any reason—ignorance, indifference, carelessness, antagonism, self-interest, malice, and so forth, either on the part of private individuals, public officials, sanitary boards, governments or other authorities—the sanitary laws necessary for the community at large are ignored, neglected, or imperfectly carried out, dire results are apt to ensue, in the shape of a lowered standard of health, an increased predisposition to disease, and a high sick and death rate. Thousands, nay millions, are daily losing strength, health, and even life, from this cause; especially in semi-civilized and barbarous countries. Hence it is a matter of universal interest and concern; and all should unite to make and enforce thorough and prompt sanitary legislation, and prevent public uncleanness, dirty streets, houses, people, clothing, overcrowding of the poor and the working classes, a deficient water supply for baths, and other antagonists of health. Unquestionably, even at the present day, we often pay the penalty in the loss of the health and life of many, because we fail in our hygienic duty. And the non-avoidance of preventible disease among all, but especially the poor and the working classes, that suffer most and have least power to succour themselves; in-

volves a tale of culpable neglect, nay crime, towards the thousands of their fellow-creatures who annually suffer and perish from this cause ; and of sin towards Him who says, "Thou shalt not kill," but shalt "love thy neighbour as thyself," on the part of employers, public officials, governments, and even parents. Nor, unfortunately, does the evil stop here ; for disease and physical degradation go hand in hand ; so that while the race becomes decimated and degenerated, morals and civilization also deteriorate.

The effects of a defective public hygiene, even in one particular, are varied. For instance, the health and strength of a whole community, army, navy, or even an entire nation, has deteriorated by defective and improper food or lax morality. The inhabitants of an entire village, town, or city may be slowly poisoned, and become sallow, emaciated, weak, and on the border-land of disease, by defective drainage, badly-ventilated dwellings, and so forth. And some of the most frequent, widespread, and deadly diseases of the infectious and contagious kind, that have even decimated entire nations, have been propagated, if not originated, by these and a defective quarantine. The indirect effect of lax private hygiene on

public health will also be apparent. Thus, by persistent want of cleanliness of the person, clothes, household, and so on, the seeds of some of the loathsome infectious diseases—for example, small-pox, scarlet fever, typhus, etc.—which are always floating about invisibly, may find a suitable soil in which to be developed. And once begun, they may spread indefinitely, till the entire neighbourhood, and even nation, may suffer.

The hints given the Israelites regarding public health are found mainly in the Pentateuch, and are both numerous and valuable. In the desert, the nation was not scattered, but congregated by tribes in a camp, somewhat like an army of soldiers. But the laws for their camp life were also meant for their cities (Deut. xxviii. 3-16), and are therefore suitable for us. The Bible goes minutely into this subject, evidently because it was deemed important, inasmuch as public instruction was of private application.

Special hygienic care was no doubt taken of the Israelites in the Wilderness, with a view to keep this chosen people, and model nation healthy. They lacked nothing that was good for them; their clothing did not wax old; and their feet swelled not (Neh. ix. 22). Nay, but for sin

they would all have been preserved and permitted to enter the Promised Land. But, because of this many were slain by the sword, pestilence, and old age. And it was doubtless their superior public, and private health laws, which kept them generally so free from disease. The site and the sanitary arrangements of their camp were perfect; and for cleanliness, water supply, and so forth would put to shame those of the best cities of modern civilized nations. The public health hints on the two subjects most necessary for the healthiness of their camps, towns, and cities are especially full, minute, and worth study. These are, town cleansing, one of the chief preventives of contagious and infectious diseases; and the system of quarantine and segregation for opposing their spread. The importance of the laws of the Bible for preserving the public health, and saving sickness, may be inferred by the stringency with which they were enforced, and the penalties imposed for disobedience.

As with private hygiene so with public sanitation, of which the former is the basis; to ensure its general observance, so essential to the health of the masses, the people themselves must be taught its value, and the main facts on which it

is based, by means of the press, the platform, and the pulpit ; they must be shown that personal cleanliness, pure air, avoidance of dietetic and other excesses, corporeal, mental, and moral, as well as in general good conduct and morality, united with physical and psychical training, are the best preservatives of public, as they are of private health. Otherwise, measures will often be evaded, and at best carried out negligently or imperfectly. They should also be educated to interest themselves in public hygiene ; in order to aid the observance of sanitary enactments, and promote the furtherance of the objects for which these are made. Much of the disease which afflicts, and sometimes carries off the rich and the great, unquestionably originates among, and radiates from the poor. Hence it becomes not less the interest, than the duty of the former, to aid the latter in health maintenance by promoting hygiene, and among other things giving them free baths to favour cleanliness ; public grounds, gardens, gymnasia, for recreation ; well-drained, ventilated, and water-supplied dwellings ; properly cleaned and sewered streets, and especially by having the poor properly fed, housed, clothed, warmed, and kept clean. This implies the study

and practical application of many social problems which it is not the province of these pages to discuss. Essays are written, and much time and talent occupied, in discussing the origin of life—a subject of great scientific interest—but after all, of little more practical importance, than ultimately confirmatory of the Bible statement “after his kind.” But how little pains, comparatively speaking, are taken to discover the various morbid causes of its destruction, and from these to devise means to prevent its enormous waste, matters of the utmost, and indeed world-wide moment.

As the public bearing of those private hygienic matters that have been already studied, viz., food, air, water, rest, exercise, mental, moral, and spiritual culture, has been alluded to under these special titles, they do not require further mention; and attention has now to be turned only to certain matters not included under any of these heads, viz., dwellings, sewerage, disease prevention, and disinfection.

CHAPTER XIII.

DWELLINGS.

NOT only the domestic habits, but also the vicissitudes of climate, compel civilized races at least, to shelter themselves in dwellings; while their social instincts and other circumstances cause them to mass themselves in villages, towns, and cities. But it will be evident that many of the details of private hygiene cannot be so fully carried out in houses as in the open air; and that the supply of water and air, the sewerage, and so forth, are not so completely under individual control, and therefore apt to be less perfect. When several persons or families occupy one dwelling; and especially when many do so, as in tenement houses; the difficulty in fully carrying out the rules of hygiene becomes correspondingly increased; so that without the greatest attention to the original construction of the building, and its constant superintendence afterwards, it is impossible to keep its ventilation

sewerage, etc., so fully in order and so constantly at work, as they ought to be. Hence the sites for dwellings should be most carefully chosen; and the buildings themselves scientifically constructed, and well managed afterwards. The following are the chief conditions that modern science deems necessary to ensure a healthy home :—*First*, a dry site free from moisture and malaria; *second*, a light and cheerful aspect; *third*, sufficient ventilation to carry off all impurities resulting from respiration, cooking, sewerage, and other causes; *fourth*, good sewerage to remove at once and completely, any refuse apt to taint the air; *fifth*, a good supply of pure water for drinking, cooking, house-cleaning, clothes-washing, etc.; *sixth*, a construction ensuring constant and perfect dryness of the foundation, walls, and roof; *seventh*, size large enough to prevent overcrowding.

The fundamental object to be aimed at in house construction, should therefore be healthiness, and above all things, complete aerial purity. Comfort, convenience, and beauty, too often regarded as matters of first importance, are really of secondary consideration. Still there is no reason why these should not, but every reason why they should, be gratified as far as attainable on the

main desideratum, inasmuch as the four are by no means incompatible ; beauty, convenience, and comfort being all as attainable with, as they are possible without, perfect healthiness of house construction.

Modern science has decided that the diseases which arise from faulty dwellings, are mainly or entirely those caused by impure air. The atmosphere of a building may be contaminated in various ways, as for example by malaria or impure air from an ill-chosen site ; or by imperfect ventilation, which confines noxious and putrescent exhalations ; or by dirtiness of the house, or its inmates ; or their clothing, owing to laziness ; or a deficient water supply ; and so forth. If an entire street, block, locality, or city is thus circumstanced, matters are so much the worse, and the evil effect on health all the more widespread.

For the same reasons, not only our dwellings, but also our streets, villages, towns, and cities should be carefully planned, to ensure proper ventilation, and the complete removal of those foul vapours that emanate from our bodies, houses, sewers, and so forth. The larger the community the more the need for this ; and the greater the difficulty in perfecting its sanitary arrangements.

Narrow crooked lanes and streets, which obviously interfere with ventilation, should be avoided. The sites of villages, towns, and cities should also be carefully chosen so as on the one hand to avoid malaria, damp, noxious vapours, hot or cold winds; and on the other hand, to favour free ventilation and a due supply of heat and light. The advantages of the wide and straight streets, and ample house-room of the judiciously-planned cities of the modern type, over those of the old system, may be seen by contrasting the older parts of London, Paris, New York, or other cities, with their newer portions; or the arrangements of a modern city like Philadelphia or Chicago, built entirely on the parallel principle, with Brussels, Boston, and other cities both of the old and new world, constructed on the old-fashioned irregular plan.

The healthiest houses and communities are invariably those in which these conditions have been all, or nearly all, attained. When they are unfulfilled, wide-spread disease may sooner or later be the result. Unquestionably, those great and fatal epidemics, which afflicted the cities of the old world during the middle ages, did not arise, as once suspected, from such grand cosmical conditions as

earthquakes, comets, mysteriously poisoned air, or special epidemic conditions ; but from simpler and more familiar *household* causes ; and were mainly due to overcrowding in faulty dwellings ; ill-planned, narrow, winding streets ; a deficient water supply ; uncleanliness of the person, dirty clothes and houses ; deficient removal of excreta and refuse ; careless gross habits, innutritious food, and frequent famines. Fortunately we are strangers to the extent and virulence of these old-time epidemics ; but many of the diseases that still afflict communities, especially the infectious and contagious ones, are unquestionably due to minor conditions of the same nature ; and may arise, for example, from the house, town, or city being badly placed, the site being either too low to permit satisfactory ventilation and drainage ; or situated on moist, malarious, newly-made, and therefore unhealthy, ground. Or it may spring from the streets being badly planned, and imperfectly sewered, and so forth. The judicious selection of a locality ; the proper construction and the subsequent hygienic management of our houses and communities ; have all much to do with health-maintenance, and life-prolongation. Inattention to one or all of these conditions, may materially interfere with both

health and life. Much sickness and many deaths arise from badly situated, faultily constructed, and mis-arranged abodes and cities. It will, therefore, be clear, that a knowledge of sanitary household arrangements on the part of tenants, architects, builders, and others, is the first step towards preventing disasters of this kind, and attaining a higher standard of individual, and national health and longevity than now prevails.

The Bible says little regarding the domestic life of primitive times; but it avers that our first parents, at least during their earliest estate, had no covering save that of purity and innocence. And probably the grass-clad ground, and shelter of a bush, a tree, rock, or cave, was all they required for a nightly shelter in the Paradisaic climate of Asia, too mild to cause discomfort, and free from influences that could harm their disease-proof bodies.

Subsequently, the pastoral patriarchs and their families, or tribes, dwelt in tents. At a comparatively early period we read of the massing of the people into communities; and of the building of the first city by Cain, in the land of Nod, eastward of Eden, which he named after his son Enoch (Gen. iv. 17). After the Flood, we hear of still larger ones, Babylon, Nineveh, Calah, and others (Gen.

x. 11). But the Scriptures say nothing regarding their healthiness or hygiene.

At a still later date, the Israelites dwelt, during their wanderings in the Wilderness, in tents and camps ; while subsequently to their occupation of Canaan, they occupied villages and cities. But we cannot glean much information from the Bible, regarding the hygiene of their dwellings. Three sanitary facts in their history, however, are worth notice. *First*, they dwelt in *tents*, that is the most healthy and comfortable kind of abode, in which they could live in the climate of Palestine, inasmuch as they were cool, well-ventilated, and, in a measure, tantamount to living and sleeping in the purest of all atmospheres—the open air. Their encampments also were well chosen in a hygienic point of view, being in a dry non-malarious desert, and arranged methodically, so as to favour cleanliness and ventilation. Furthermore, frequent change of site, prevented complete pollution, and ensured healthiness. *Second*, the Canaanitish dwellings, villages, and cities, were invariably situated either on the sea-side, lake-shore, or on some eminence, hill, hill-side, or high ground, and therefore on a site which was dry, cool, well-aired and lighted, and far above noxious emanations from the ad-

jacent plains and valleys. Thomson says in "The Land and the Book" that they are so still; which appears a fortunate and doubtless providential premeditation; for a whole family in the East—parents, children, and servants—sleep in the same room, and with slight, often no change of garments. And it was indisputably the same in Bible times; so that, although their rooms and houses were small and crowded, good natural ventilation helped to lessen the atmospheric impurity, and the resulting danger to health. *Third*, in this selection of sites for camps and cities, they were doubtless Divinely guided; at first by the Shechinal pillar of cloud and flame, and afterwards more indirectly through their leaders.

At the present day we have no direct superhuman guidance, to aid us in the selection of sites for dwellings or communities. But we have these invaluable Bible hints to help us, and we are furthermore promised Divine aid, if we ask it, in all we think and do, to supplement our individual common sense and experience. The Bible narrative, however, indirectly indicates the wisdom of selecting elevated, in preference to low-lying sites; and avoiding such as may be damp, malarious, too sheltered, or badly situated for sewerage, and so forth.

CHAPTER XIV.

SEWERAGE.

AS ventilation is the system by which the noxious gases and vapours of a dwelling or community are dispersed ; so sewerage is that by which refuse water and filth are carried off. The latter has various sources ; such as the solid, semi-fluid, and liquid particles, continually thrown off by the human skin, lungs, kidneys, and bowels ; those which originate in the ordinary processes of daily life, including dust, débris, and solid waste from food, clothing, trades, manufactories, dwellings, streets, and so forth. The accumulation of either is not only unsightly and offensive to the sense of smell, but also unsanitary ; inasmuch as it may decompose, poison the air we breathe, the water we drink, the food we eat, and thereby the blood ; so as to generate deadly and wide-spread disease. To its insufficient, or non-removal in former times, was often due the great prevalence of sickness ; and many of the ailments now common

in uncleanly houses and dirty communities, are traceable to the same source. The judicious disposal of the sewerage of a house or locality, forms one of the most important problems of sanitary engineering ; and is at all times, and everywhere, a matter of health or sickness, life or death, to millions.

In this busy age, and especially in thickly-peopled centres, where every man cannot be his own servant, even if he would ; we require some readier method by which refuse can be carried away, than that of the Israelites. The great difficulty is to select for different cases, the best system out of many available ones. Our modern plans depend mainly on the size of the place, its capabilities, site, surroundings ; and the habits and enlightenment of the people and public authorities over them. The two chief modes at present in vogue for the removal of sewage are the *wet* and the *dry*. Removal by *water* and the aid of sewers, drains, and pipes, is, when carefully managed, the readiest, quickest, cleanest, often the least expensive ; and for large communities one of the best, where a copious supply of water for sluicing is procurable, either from rain, slops, sinks, clothes-washing, lavatories, baths, and so on. If the refuse can be

at once diverted into a river, stream, or running water of some sort, so much the better. The dangers of the wet system are twofold ; namely, contamination of the adjacent ground, wells, and water, by leakage through broken pipes, and the escape of effluvia by badly-placed traps.

The *dry* method is useful where removal by the first plan is impossible, from a deficient supply of water, or want of a proper fall, or a severe climate—like that of Canada—which freezes the water for months. In those circumstances, the refuse must either accumulate, or be removed periodically. The latter plan is followed in some large communities. When this mode is employed, the receptacles should be special ; the refuse thoroughly mixed with deodorants, disinfectants, and anti-putrescents, and also quickly removed.

The superiority of the Israelitish plan, where it can be carried out, over both of the above methods, will be apparent. Putrescent matters were never deposited at all in their tents or camps. And they at once covered up, and thus destroyed, every particle of this before it began to decompose, and thus become offensive to sight and smell, or likely to cause disease.

Obviously it would be impossible for every village,

town, and city to follow the same plan. Our decision as to the best method to pursue, must be guided by the varying circumstances of each case. Judgment is necessary for the selection of the best ; in individual instances. In all, especially in large places, the water system of sewerage is the best ; the débris being carried into rivers, large lakes, or the sea, to be dispersed. Where water drainage is unattainable, the dry method may be followed, and the material utilised or not as manure. But this obviously requires careful management, particularly in large communities, and should be under strict official supervision, as it necessitates speedy and periodic removal, concealment, or, better still, admixture with ashes, charcoal, quicklime, special chemicals, such as Macdougall's or Calvert's powder, carbolic acid, Condy's fluid, and other deodorants, disinfectants, and anti-putrescents ; of which one of the very best is common earth, where a full supply, and the subsequent removal of the somewhat bulky mixture are attainable. It will be evident, however, that, owing to the difficulty in providing a sufficient supply of earth, and the bulkiness of the system, the ancient Israelitish plan of earth disinfection, is of limited availability in large communities, although no better could be devised for disinfecting

and decomposing sewage after it has been removed to a judicious distance; especially if it is to be converted into manure.

The plan of keeping the refuse of communities for manure, has its advantages and disadvantages. But even when the water system of removal is practicable, some utilitarians prefer the dry method, in order to save this valuable fertilizing product. If the experiment causes no direct or indirect detriment to health; and does not become a public nuisance, it cannot be deemed objectionable. But if, on the other hand, it does either, and especially the former, safety to health and life should first be sought, and profit made a secondary consideration. But in all cases the old-fashioned cesspools, middens, dead wells, often used for preserving this, should be discontinued; because they freely emit offensive disease-generating effluvia. And it is well known that the permission of dirt-heaps, pig-sties, and so forth, in the centre of villages or cities, both barbarian and civilized, was, and still is, the main cause of much disease, especially of the infectious and contagious kind, by contaminating the air, the earth, and the water.

The Israelites were very particular about this department of hygiene; and the laws laid down in

the Pentateuch regarding it are both minute and stringent. The small size, compactness, and open nature of their tents; the methodical arrangement of their not too bulky camps; and the regularity and comparative ease of their life in the Wilderness; all favoured the fulfilment of the sanitary rules regarding sewage. In their system each individual performed his part; and in fulfilling this, he personally aided public hygiene. No filth was permitted to accumulate either in tent or camp, but was at once deposited well beyond the latter. Its immediate disinfection by earth was equally compulsory. Above all, the deposit most likely to putrify rapidly; gives out noxious emanations, and thereby causes serious disease, was only permitted *beyond* the camp; whither the people were ordered to "go abroad;" they doubtless had public resorts (Deut. xxiii. 12-14), and were commanded to cover the refuse up carefully with earth, so as to ensure its speedy decomposition, disinfection, and deodorization—a health hint which many of the lower animals give in a no less expressive manner. From the Bible, the suggestion for the now well-known "earth system" for water-closets and night-chairs was doubtless derived; and for these nothing better could be devised.

Again, the Israelitish sacrificial code was one that caused a large accumulation of refuse ; necessarily opposed to cleanliness, and dangerous to health. Hence, strict and minute rules are also given for the removal of this. Thus, after a burnt offering, the priest was ordered to put off his garments, replace them by others, and then carry forth the ashes unto a clean place without the camp (Lev. vi. 11). Moreover, after burning on the altar those parts of the bullocks and the goats necessary for the sin-offering ; the remainder of the animal, namely, the flesh, hide, and refuse, had to be carried out of the camp, and burnt with fire (Lev. viii. 17, xvi. 26, 27). Better regulations could not have been devised to accomplish the twofold object in view—namely, camp cleanliness and health preservation ; while by the speedy and thorough removal of refuse ; and the non-deposition of the worst kinds ; neither sight nor smell was offended ; the camp was kept from physical pollution ; and burning, or covering these with earth outside the camp, deodorized, disinfected, and destroyed them ; and thereby prevented air and water pollution, and the dire diseases apt to arise therefrom.

It is well to observe, however, that still another

reason, and that an important one, is given for the promulgation and strict enforcement of these hygienic rules: "For the Lord thy God walketh in the midst of thy camp; therefore shall it be holy" (Deut. xxiii. 14). The latter term here evidently denotes *purity* by the removal of that which is physically offensive.

In this department of hygiene it will be evident, that the Israelitish practice, so simple and so perfect; is in every way equal to, and in some respects in advance of ours, at the present day. And it would be well if responsible persons, whether private individuals or public officials, were to make the sewage system of modern dwellings, villages, towns, and cities as complete and as efficacious. Doubtless the great healthiness of the Israelites in the Wilderness, and subsequently in Judea, was largely due to this cause.

CHAPTER XV.

DISINFECTION AND DISEASE PREVENTION.

MUCH of the sickness and mortality which has occurred among mankind from the earliest ages to the present day, has arisen from infectious and contagious diseases; as, for example, plague, leprosy, pestilence, cholera, small-pox, measles, yellow, scarlet, typhus, typhoid fevers, and other allied complaints. Some idea of the great prevalence and fatality of these may be gleaned, from the large decennial death-roll resulting from only four of them, even in a comparatively limited area, as quoted from the writings of Sir James Simpson on disease prevention. Thus: "In the ten years from 1856 onwards, there died in the United Kingdom from scarlatina alone 280,000; from measles alone 130,000; from whooping-cough alone 150,000; from small-pox, upwards of 60,000; or about 600,000 of our population were thus killed." Clearly it would be difficult, if not impos-

sible, to estimate the huge total mortality that must have resulted from all of the above scourges, since the first appearance of disease on the face of our globe.

When an individual succumbs to a non-communicable ailment, he suffers, so to speak, alone ; and the result, though perhaps serious enough to himself, his family, and his friends, is comparatively trivial, so far as the public is concerned. But if he sickens from an infectious or contagious disease, his illness becomes a public calamity, and a matter of national, nay, perhaps of world-wide importance. For during his entire indisposition, and especially while convalescent, he becomes a centre of infection and contagion ; his breath, perspiration, excretions, clothing, and every atom and article which comes from or touches him, being charged with the specific poison ; so that from him as a focus, the malady may spread epidemically and indefinitely, till it perhaps ultimately involves millions in its unpleasant and it may be fatal embrace. No one can foretell how long the calamity may last, and where it may end ; or calculate the amount of pain, misery, disaster, and death it may occasion.

Hence those diseases require special study ; while the means of preventing them, or of staying

their progress, becomes a matter of the greatest moment, and a grave and momentous question both for legislators and physicians. Plans have been suggested to *stamp* them out by a combined system of quarantine, or isolation of the sick and their nurses, and thorough disinfection ; the former meant to let the matured disease die out, and the latter to kill the new germs before they can develop fresh mischief. And doubtless if every individual, family, community, and nation in the world, were to fully carry this device out, disease of this kind would eventually and even soon disappear, or become so rare as to be a curiosity. But so much ignorance still prevails, especially among the masses ; and so much stubbornness, indifference, and antagonism among nations, that it would be impossible to carry this plan out effectually. Most people are convinced of the advantages of the decimal system of weights, measures, and coinage ; but how difficult it is to make nations so unanimous as to agree to its universal adoption ! So is it with disease prevention. And hence such plans must for the present be regarded as little else than theoretical and chimerical, at least as far as the race is concerned, and even as regards nations ; though by no means impracticable in smaller communities, where unanimity of

opinion and combined action are less impossible. Even in the latter, however, one great and often insurmountable difficulty consists in effecting complete separation of the sick from the healthy. And thus, as yet, we are driven back in great measure on the second or germ-killing part of this system of stamping out disease.

But this, the poisoning of disease germs as they float in the air or water, or nestle in clothes, and other media, by which they are communicated from person to person, is a most important object; and is effected by what are called *disinfectants*, of which nature has bountifully supplied various kinds, though as to their relative and actual virtue and value as such, however, there is still much controversy. The best of those now in favour are, the fumes of burning sulphur, or sulphurous acid, chlorine gas, and those already mentioned in Chapter XIV.

The exact nature of these contagious germs on which disinfectants are required to act, so as to destroy or render them inert, is not yet known. They have never been chemically or microscopically detected in the blood-tissues, secretions, and excretions, in which they are propagated; nor in the air, water, or soil by which they are spread.

And it is still undecided whether they are inconceivably minute particles of solid, fluid, semi-fluid, or gaseous decaying matter, which act in the glands or blood somewhat after the manner of ferments; or if they are animal or vegetable parasites that enter and live in the blood or tissues. We know, however, that hair, pus cells, epithelium, and clothes are the usual media to which they cling; and that water and air, both pure, so-called, and impure, but especially the latter, are the principal vehicles in which they exist, until they meet with a suitable individual on whom to fasten. When a contagious disease exists, therefore, our object should evidently be to prevent the air or water from being thus contaminated; or, if that is impossible, we should strive to lessen or altogether destroy the contagion with which they have already been charged.

The Bible references to this subject are especially worthy of note. Its most binding hygienic enactments are those which aim at arresting or preventing the spread of diseases of the infectious and contagious class. The chief malady of which the Bible speaks is leprosy; sometimes called a "stroke," or the "plague." It is doubtful of what this consisted. Little is known beyond the fact that it was a skin

disease, very contagious, and transmissible from person to person by garments, leather, wood, and other things. Although fresh cases were continually occurring, it is not known what originated them. It was hereditary, loathsome, insidious,—regarded as a type of sin and moral pollution (Gen. xii. 17 ; Numb. xiv. 37), inflicted as a special punishment for sin; and both sent and cured by God alone. Leprosy is still common in Syria ; but some consider the Bible variety a distinct and peculiar malady. Whether or not, the Israelites were evidently afflicted with this awful curse beyond all modern example ; the disease being of many kinds —of the body, garments, and houses, the latter two being not only unknown, but utterly unintelligible at the present day.

Three varieties of body leprosy, or *Berat*, are mentioned in Lev. xiii ; namely, *Boak*, a form of disease which did not render the person unclean ; *Berat lebena*, or bright white Berat ; and *Berat cecha*, dusky Berat, spreading in the skin. Only two of these, namely, the second and the third, were what Moses called *Tsorat*, that is, venomous, malignant, and contagious ; and of these one is at first undistinguishable from a harmless eruption. Hence the need for repeated inspection.

The chief mode of treating and preventing it among the Israelites, consisted in complete isolation of the sick and their effects; and minute rules for this are given (Lev. xiii. and xiv). When its presence was suspected, the person was taken to the Priest or High Priest, whose intelligence and skill decided its nature (Lev. iii. 1-17). And we find curt rules laid down for its management, both when the disease was uncertain and when it was real leprosy. When still doubtful, the individual was pronounced unclean, and shut up for seven days. If the disease had not spread, but was then stayed, he had to wash and be shut up for seven days more; when, if the eruption had darkened and not spread, it was only a scab; in which case he was to be considered non-leprous, and had merely to wash his clothes to be considered clean according to law.

But if the eruption had spread at the end of the first seven days' quarantine, it was decided that the disease was true leprosy. In this event, the patient was deemed unclean, shut up and compelled to dwell alone without the camp till the end of a second, and, if necessary, till the expiry of a third period of seven days, lest he should infect others (Lev. xiii. 43, 44). Leprosy

(being regarded as a divine infliction), the individual was enjoined to rend his clothes, bare his head, put a cover on his upper lip, and cry "Unclean, unclean," in token of grief and humiliation. The law of seclusion was strict. Even Miriam was not exempt (Numb. xii. 15); nor King Uzziah (2 Kings xv. 5; 2 Chron. xxvi. 19-21). It was necessary to prevent the spread of infection. In the camp lepers could scarcely avoid contact with others. Every person and thing they touched was considered unclean; and so in turn all that these touched—a rule which necessarily made their company undesirable. It is not certain if Israelitish lepers were excluded from cities and towns in later times by law, as they were from the camp in the wilderness. But even if not, they were the objects of such aversion that they preferred to associate together outside the city gates (2 Kings vii. 3; Luke xvii. 12).

The garments of a leper, and also leprous linen, woollen, or skin clothes, had also to be inspected by the priest. If doubtfully infected, they were shut up for seven days. If leprosy had not appeared, then they were to be rewashed, and pronounced clean. But if they did have leprous spots, they were to be shut up for seven days more, and then rewashed. If the spots had not changed

colour—even if they had not spread—the garment was unclean, and had to be burnt. But if the spots had darkened, the part was to be rent out of the garment ; after which, if it reappeared it had to be burnt. If it did not reappear, then the garment was deemed clean. Garments found to be distinctly leprous on first inspection, were at once burnt.

On release from quarantine the patient had still to follow certain obligations of the *law of the leper*. After inspection by the priest a sacrifice was offered. The person had then to shave his hair and wash his body and his clothes with water. After which he could go into the camp, but not yet into his tent. On the seventh day he had again to shave his head, beard, and eyebrows, wash his body and his clothes ; and then he was considered perfectly clean, and might now enter his tent. If too poor to provide the requisite sacrifice, this was done for him ; so that there might be no violation or evasion of the law.

According to Thomson, the law of separation in loathsome diseases is still in force in some Eastern countries ; where lepers are compelled to dwell outside the city in separate houses and even villages. Near the gate of Zion, they have a village

or quarter, in which the hovels are not much better than dog kennels, and which no one is permitted to visit, except those who carry their daily food. Those who are not compelled to live outside have a separate abode ; and are shunned as unclean and dangerous. No healthy person touches them, their clothes, or utensils. So, in the East, leprous beggars never touch the passer by, but stand apart and cry, "Unclean, unclean." Among the tent-dwelling Arabs, also, lepers are put out of the camp.

The rules given for house leprosy are equally minute (Lev. xiv. 33, 34). When suspected, the house had first to be emptied, and then inspected by the priest. If decidedly leprous, it was shut up for seven days ; at the end of which, if the disease had spread, the leprous stones had to be removed, and cast into an unclean place without the city ; and fresh stones put in. The house had also to be scraped within, and the dust put in an unclean place out of the city. The plaster so removed had to be replaced by fresh mortar. After these precautions, if the plague returned, the house was considered incurably unclean, and had to be broken down ; and its stones, timber, and mortar carried unto an unclean place out of the city. If the plague had not spread, however, after scraping, the house

was deemed clean and fit for reoccupation, after due sacrificing and sprinkling according to the law.

The law of the leper extended even to those who helped to cleanse a leper's house,—doubtless because they might thus catch the disease and communicate it to others. Whoever lay or ate in the house had also to wash their clothes (Lev. xiv. 46, 47). Even if a person simply entered a leprous house while it was shut up, he was deemed unclean till even.

Moreover, if a leprous person died, he was buried apart from others. Even leprous kings, like Uzziah, were not permitted to be laid in the royal sepulchres (2 Chron. xxvi. 23; 2 Kings xv. 7). Nor were priests exempt from any of these laws. If leprous, they were forbidden, under penalty of being cut off from God's presence, to minister in holy things or to eat the shew-bread or sacrifices; and were considered unclean, like other Israelites (Lev. xxii. 4-6).

This sanitary code for extinguishing, or at least restricting, leprosy, was adapted both for the tent life of the earlier Israelites, and their cities in later times. And, modified to suit the times, it is equally applicable for the prevention, or limitation of the

contagious and infectious diseases which prevail at the present day. The precautions which it includes are most complete, and comprise :—

First ; complete isolation of the sick from family, friends, the general community, and everything belonging to these, till the disease had disappeared. This prevented the communication of disease by personal contact, during the progress of the disease.

Second ; thorough purification of the patient before re-entering the camp ; and even then, a second minor quarantine, and purification of seven days before again using his tent. This rule formed an additional security, by removing lingering particles of infectious disease, and thus preventing its spread from person to person.

Third ; disinfection, and, if necessary, destruction of his clothes and other effects before again using them, and of his dwelling before reoccupying it.

Thus neither could the disease be transferred from sick persons outside, to healthy ones inside the camp by infection or contagion ; nor conveyed into their bodies by contaminated air, water, or food.

It is both curious and instructive to note, the great similarity that exists between the following—theoretical suggestions of one of the most philo-

sophic and far-seeing physicians of the present century; and the above practical and efficacious rules laid down by the great Hebrew sage—thousands of years previously. Sir James Simpson's plan comprised maxims, by which he estimated that, if faithfully and universally carried out, small-pox and other infectious diseases, would be stamped out of Great Britain within a period of six months, or a year. The regulations drawn up by him were as follows:—

“1. The earliest possible notification of the disease after it has once broken out upon any individual or individuals.

“2. The seclusion, at home or in hospital, of those affected, during the whole progress of the disease, as well as during the convalescence from it, or until all power of infecting others is past.

“3. The surrounding of the sick with nurses and attendants who are themselves non-conductors or incapable of being affected; inasmuch as they are known to be protected against the disease by having already passed through cow-pox or small-pox.

“4. The due purification, during and after the disease, by water, chlorine, carbolic acid, sulphurous acid, etc., of the rooms, bedclothes, etc., used by

the sick and their attendants, and the disinfection of their own persons."

Simpson's simple yet practical regulations—though now, thanks to the rapidly advancing strides of science, deemed neither impossible nor improbable—were thought by many, when they were penned in 1868, to be the dream of an enthusiast. This need never have occurred had the Mosaic record and historical facts of the Bible been kept in view. In small-pox we have the advantage of the protective power of vaccination. But in the case of other contagious diseases, the laws laid down by Moses are the most thorough, especially as to the mode of disinfection by fire.

And thus the wise hygienic laws of Moses, made for public protection, are unquestionably as suitable for us and the present day, as for the Israelites and the early period of man's history, during which they were framed; and as likely to prove efficacious, in stamping out contagious and infectious diseases, as any of the rules devised in modern times. Viewed thus they are worthy of our earnest study. Indeed, sanitarians in this, as scientists in other directions, are only beginning to discover the importance of truths that the Bible has been silently inculcating for ages; and that might have

been long since acted on, and much health and many lives thereby saved, had mankind wisely followed Divine advice to "search the Scriptures" for guidance ; and not injudiciously "hated instruction, and cast His word behind them" (Psalm l. 17). Jehovah said to the Israelites regarding this very plague of leprosy, "Take heed that thou observe diligently, and do according to all that the priests and Levites shall teach you. As I commanded them so shall ye do" (Deut. xxiv. 8). And doubtless it would be well were we to accept the same warning, and follow the same laws, modified to suit the age and special conditions, under which we live. It is mainly the greater neglect of sanitary laws in modern times, that makes the various infectious and contagious diseases that now afflict us, so numerous, fatal, and so much more persistent than the Israelitish leprosy. If our quarantine system, the segregation of the sick and the suspected ; and the purification, and destruction of infected clothes, effects, dwellings, etc., were as perfect as theirs ; we might soon be as free from those modern scourges of the race, as they were from their special disease—leprosy—when they implicitly obeyed God's sanitary laws, which, like ourselves, they did not always do. If,

for example, every case of small-pox were at once and completely isolated, till all chance of infection had gone ; while the clothes, bedding, effects, dwelling, and sick room, were also thoroughly disinfected, and if necessary destroyed ; the patient's family, friends, and others would in all probability escape. And thus the disease would soon disappear ; or at least ultimately become so rare as to be a curiosity. And so also of scarlet fever, and infectious diseases generally. Strange to say, it is mainly the masses—that is, those who are most interested in this reform—that deem this a restriction of the liberty of the subject ; and stand most in the way of its perfect accomplishment, by objecting to, and when possible, evading isolation ; often chiefly, or solely from an unnecessary fear that the sick may be neglected, if removed from the personal care of relatives or friends. As we prevent homicidal lunatics by legislation, from destroying the lives of their fellow-men ; why should we not act similarly regarding small-pox, that annually destroys hundreds to their one ? Regarded dispassionately, no more harsh measures would be required towards the public, than those now enforced by law, in every well-regulated household where infectious disease exists.

The bearing of the Israelitish mode of burying lepers apart, on our modern disposal of the dead from infectious diseases, is also a matter for serious consideration. It is only within the past few years that this subject, so long ago studied by Moses, has been taken up by hygieists. The Mosaic rules for the treatment of house leprosy are equally worthy of study. Not till within a comparatively recent date, has it been generally recognised that, the walls, and especially the plaster of private dwellings, and public hospitals, may, by the absorption of disease germs, contribute to the spread of small-pox, typhus fever, erysipelas, puerperal fever, and other infectious and contagious diseases. Yet this fact was long since pointed out indirectly in Leviticus. But even now, the benefit of small "cottage" hospitals, built of wood, brick, or iron—first suggested by Sir James Simpson in 1848, for the treatment of infectious and contagious diseases—is not so fully and widely recognised as it ought to be, seeing that one of their chief advantages is, that they may be cheaply reconstructed every few years, as necessary; and the disease germs, so very tenacious of life and venom, so subtle and readily overlooked, be thus periodically destroyed in the most effectual way. Is it

surprising that judicious sanitary suggestions, of strictly human origin, like those of Sir James Simpson, are so often slowly received, and still more tardily followed, when the wiser, more complete and efficacious ones of the Bible, have been so long contemned, or put aside, because supposed to be meant only for the wilderness and the Jews?

CHAPTER XVI.

CONCLUSION.

INFINITE wisdom and love has thus pointed out what is good for our perishable bodies, as well as for our immortal souls; by giving us the Bible, which is clearly a guide-book for time as well as for eternity; that tells us, not only, how to be holy, but also how to be healthy, two, if not closely allied, at least parallel, conditions.

But when we consider God's character and our relation to Him, the sanitary science He has thus imparted, is no more than we might expect to find. Indeed, it seems logically reasonable to infer, that the Creator, who has imparted laws for the welfare of our souls, would also provide others, to help us to keep its earthly tabernacle in health. And it would seem strange, if He who manifests such intense anxiety for our spiritual prosperity, should show none for our physical welfare. Not only reason, but also instinct, should impel mankind to turn to God and His Word for hygienic

instruction; for where could we find a better counsellor or safer advice? Can a mortal, however gifted and studious, but still at best only a feeble interpreter of Nature's wonderful laws; a puny, and often inefficient investigator of God's marvellous works; who even owes the brain and the intellect that enable him to carry on his investigations, to the Almighty; ever become better informed regarding the human frame, or know better what best suits it, than its Creator? (Isa. xxix. 16). Who can comprehend more clearly the intricacies and requirements of the body; see sooner when it is out of repair; or understand better how to remedy and restore it to working order; than the omniscient and all-powerful Being who fashioned it? (Psalm xciv. 9, 10). The best interpreter of Nature, is surely—not the being who is merely a fractional part of it, but—its Author and Lord (Isa. xlv. 9). Who can conduct us better in the planetary abode made expressly for man; and explain how to prevent or lessen the injurious effects of disease-inducing and death-menacing agencies, than He who permits them to exist? The Great Physician, from whom our health and life spring, is surely a better and kinder counsellor, regarding those twin boons, than any earthly

authority. Our Maker's advice is better than that of a mere fellow-creature ; and the aid of the Almighty than the help of an "arm of flesh." Unreliable earthly skill can never equal the far-seeing maxims bequeathed by the Divinity. Nor is human guidance enough for humanity, seeing that, it is not in man to direct his steps aright (Jer. x. 23). Yet how much oftener do men ransack libraries, instead of consulting the record of the far-seeing and infallible Jehovah ; and prefer limited human experience to His underived and all-embracing information ?

But, for various reasons, the health-hints of the Bible are less minute and searching, than those given for our moral and spiritual guidance. On the one hand they are not so indispensable to our eternal welfare ; the attainment of a happy future with God being the main object of our existence here ; while loss of health, and everything else in this world, even life itself, are of themselves less important, to beings whose existence is to be unending, than loss, or rather death, of their immortal souls (Mark viii. 36). And, on the other hand, having endowed us with reason, and made us free agents, God leaves the interpretation of His health-laws largely to ourselves. The

hints are there as a special legacy ; and it is for us first to study, and then to judiciously apply them.

The marvellous fact that information of such value should have lain so long, if not undetected, at least unnoticed and unused ; can only be explained by supposing that, as with other sciences, its significance was overlooked or underrated, because met with in a volume, and in places where we should least expect to find it ; and often, moreover, in the form of casual remarks, so familiar to us from infancy, that we, in a sense, condemn them. Others, including many, by no means superficial or hasty readers, erroneously regard the health-hints of the Bible, especially those of the Pentateuch, as a mere literary curiosity—an obsolete health code meant for a past age, a foreign people, peculiar circumstances—and neither binding, necessary, nor adapted for mankind at large ; and not even meant for the Jews of the present day. It seems to be sometimes forgotten that—like the Scriptures generally—the importance and wide bearing of the sanitary maxims of the Bible, especially those of the Pentateuch, are only discoverable by careful and intelligent perusal, and often deep study. And how truly, and even more strictly, might it not

be said of Bible Hygiene, as of its spiritual advice, "Eyes have they but they see not ; they have ears but they hear not ; they have mouths but they speak not ; noses have they but they smell not ; they have hands but they handle not ; feet have they but they walk not ; neither do they understand " (Psalm cxv. 5 ; Ezek. xii. 2).

How perfect we may ultimately make hygiene ; and how successful we are likely to be in fully carrying out its dictates, and attaining its beneficent objects ; or whether we shall ever be permitted to completely conquer and banish disease and death ; are important questions, though evidently problems of the future. God has not seen fit, in our present state of existence, to enlighten us, and perhaps may never permit us to fathom this, and many other of the myriad puzzling mysteries of creation. Some of these are purposely left obscure, because God wills that we should not know them ; and others to test our ingenuity and judgment in their discovery or interpretation. And so also with the secrets of our being. We cannot help speculating, for example, on the question, why a God of love should ever have appeared to act like a superlatively cruel Divinity, by permitting sin, disease, and death to afflict us ;

and if He is ever to act like a beneficent one by permitting, aiding, or causing their removal. Still, on this and other matters, such as the question of the health and longevity of the future, our speculations can only be vague and uncertain. And our main resource, under the circumstances, is simply, like other created beings both of higher and lower rank, to uncomplainingly accept the position, endowments, and fate allotted to us, and conclude that these and other dispensations of God's providence are somehow or other necessary for our earthly or future welfare, otherwise they would not have been so ordained.

Nevertheless, while, with Parkes, "we marvel at the abundance of life in the earth, air, and sea; at its appalling waste, and the apparently unnecessary expenditure of pain; and wonder, when we mark the condition of the human race, and contrast its present state with what it might be; and note the divine gift of mind, its marvellous endowments, lofty powers, awful perversions, and alienations; many terrible sufferings and abasements; man's capacity for happiness, and his full cup of sorrow; the heavenly boon of glowing health, and the thousand diseases and painful deaths that afflict us; we cannot refrain from again asking, Can

order ever come out of this chaos during our present stage of existence ; and, in place of this suffering, shall health and happiness ever reign ? ”

Perhaps it may be that God, in the scheme planned out for this earth, intends that man—its chief actor—shall never again be perfectly healthy and happy, as Adam is alleged to have been in his first and sinless estate, nor even attain to patriarchal longevity and immunity from disease. Disease of body and of mind are unquestionably among the crosses man has to bear through life,—the irremediable evils against which he has to struggle, either as punishments, or as merciful chastisements to lead or restore him to his heavenly allegiance. But fortunately, when God removed our invincibility to disease and death, He did not leave us without a health-guide to help us to protect ourselves from the afflictions with which the race is now vexed. And with such evidence as that pointed out in the preceding pages, no one can reasonably doubt that “afflictions spring, not from the dust, nor trouble from the ground” (Job v. 6) ; but that, both as private individuals and as a race, we hold our fate as to health and life, very much in our own hands, as did the Israelites of old ; and that, to say the least, neither

disease nor death need be so prevalent as they now are. And doubtless, as we advance in knowledge, we may continue to gradually, in part at least, throw off, as we are now slowly doing, the shackles of disease, like those of sin. So that ultimately, with a perfect knowledge of the laws of life (if this is ever to be attained), and an absolute conformity to and complete control over these (a fact,—perhaps a dream of the future), we ought to see the human frame—the mortal body and the immortal soul—once more in perfect beauty, vigour, longevity, harmonious proportion, and just balance; once more like those of the prototypes of our race, and once more a semblance of the Divine image in which they were created. If ever this world is permitted to see perfect general virtue again, then doubtless sorrow and suffering will also flee away. The Scriptures tell us that by Christ alone are they to be fully conquered, and that the last enemy to be destroyed is death (1 Cor. xv. 26), although it does not inform us when this is to happen; probably it will not be during man's present probationary state of existence. And therefore not for many years, if at all, can we expect the great and much-desired consummation to which some look forward. Indeed, it is perhaps altogether Utopian

to anticipate this, or to think that we can ever make disease and death disappear entirely. And it seems more reasonable to expect that to the end of time it will be the fate of all mankind, if not to suffer from frequent disease, at least to succumb sooner or later to sickness or decay, one form or other of which is at least certain to ultimately carry them off. God's chosen people in the Wilderness were never completely rid of either. And doubtless the same cause, namely, sin,—especially neglect of God's moral and sanitary laws, which kept disease and death among them,—will ever continue to perpetuate them among the human race generally.

However, even if we thus limit—as we are apparently compelled—our hope of complete freedom from sickness (a perfect euthanasia), there is no apparent reason why we may not materially diminish the amount and severity of the disease which now prevails as our medical knowledge increases, so that as ages advance, when individual and combined efforts have succeeded in this, we shall at least have made this world a more satisfactory prelude than it now is to the life prepared for us in the “many mansions ;” and be better able to anticipate the happier future, when all con-

nected with our present state of imperfection and discipline shall have ended, and been supplemented by a new dispensation akin to—nay, an advance on—that of our first parents before the Fall; when our bodies and our souls will be again unfettered by the afflictions that mar and sadden the present life; and, our bodily immortality regained, disease, death, pain, parting, shall have for ever fled, and our condition shall be one of healthiness, happiness, and holiness, perfect and unalloyed.

Manifestly, therefore, as private and public hygiene are subjects in which individuals of every age, clime, and condition are interested, they should both be universally studied; not however to make people over-careful, minutely attentive, and constantly fretting about their health and life,—a result apt to induce instead of to avert disease,—but to enable them to exercise a reasonable prudence in their maintenance. And it is well to remember that all classes may further the progress of hygiene by striving to awaken a “sanitary sense” among the masses: physicians, by elucidating the best modes of health-preservation and disease-prevention; magistrates, statesmen, and governments, by framing and executing wise

sanitary laws ; citizens, journalists, divines, by spreading their main features broadcast from the press, the platform, and the pulpit ; and, above all, parents and teachers, by systematically, and, if necessary, compulsorily, inculcating them at home and in schools to the youth of both sexes ; that is, to the parents, citizens, and statesmen of the future, on whose wisdom, in regulating their own and their fellow-creatures' health so much may yet depend. Assuredly the art and science of health-preservation are of more importance than the study of monetary science, and many other matters now so much in favour. A practical acquaintance with human physiology and hygiene are of more value than a minute intimacy with the dead languages, or even living history. None of the *isms* and *ologies* with which we sometimes overload our offspring, is half so important as the knowledge which tells them, how to regulate the different organs and functions of the body, and thus maintain that health, without which all that makes life pleasant and valuable, and even life itself, are comparatively worthless.

In this laudable work, the upper may help the lower classes ; masters and mistresses, their servants and workmen ; not only by the all-powerful teaching

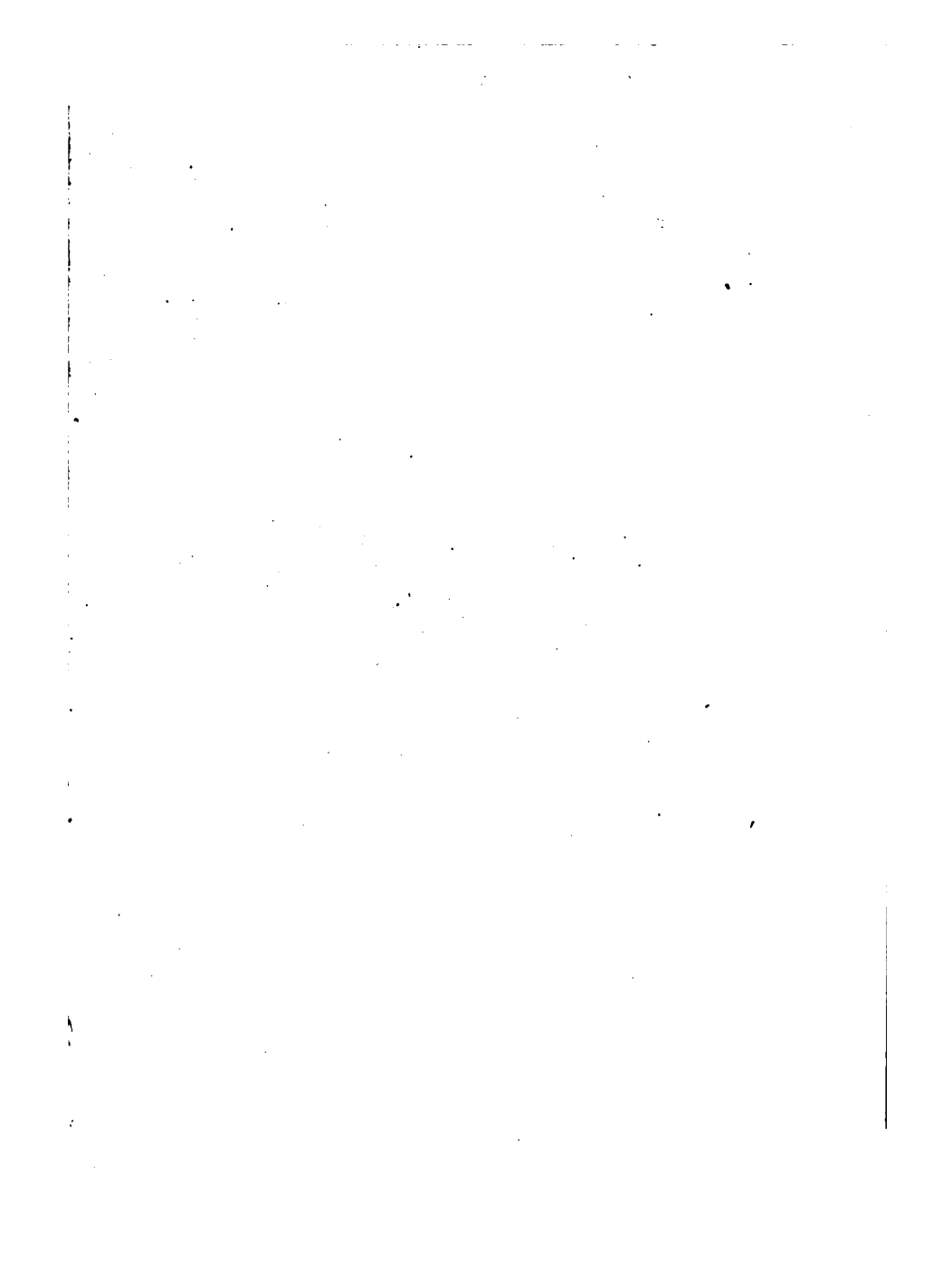
of good example, but by more direct aid. The latter, indeed, is sometimes imperatively necessary ; for without this, it is often a mockery to teach and to lecture people, so tied down by restrictions, that they are powerless to act for themselves, even when aware of its importance, and the penalty of non-observance. Nor can we vie in a more creditable or important competition than the study and practical application of hygiene. The individual, who by superior knowledge or intelligence, keeps himself or his children healthy, and succeeds in checking a single ailment, may perchance benefit, not himself and his family alone, but the human race ; since many diseases, especially those of the contagious type, spread wave-like in an ever-widening circle, the end and magnitude of which no one can foresee. Let the widespread and laudable philanthropy of the present day not only endeavour to deliver mankind from the thralldom of sin, and thus make them holy ; but let it also strive to preserve them from disease and death, and, as far as possible, restore undisturbed health. Much has already been done to effect this beneficent object ; but assuredly far more may yet, and will ultimately, be accomplished.

To those who believe in the existence of God ;

who accept the Bible as His inspired Word ; and recognise the Divine superintendence of human affairs (Numb. ix. 17 ; vi. 24-26 ; Matt. xxviii. 20), the health-hints pointed out in these pages will prove especially acceptable. Nor can any one regard them as harsh and unnecessary restrictions on public and private liberty and comfort ; but will rather gladly welcome them as a heaven-sent boon from a beneficent Creator, who cares more for us than we do for each other, and even for ourselves ; and accept them as a fresh proof of the Divine Fatherhood, and another index of God's intense love for wayward man, privileged in having such a bequest from such a source (Deut. ix. 7), inasmuch as reason, as well as revelation, tells us, that now, as in Bible times, we are safest when under the control and guidance of Him "whose banner over us is love" (Song of Solomon ii. 4) ; an affirmation which both the individual and the national experience of ages confirm.

And in carrying out this programme, the health-hints found in the Bible should not be ignored or despised, considering their source and value ; but widely promulgated, and as zealously acted on now, as they usually were by the Israelites of old. Nor is it more our duty to set a good example by

- obeying them ourselves, than to widely disseminate them ; and, above all, to teach them to our children (Deut. xi. 18-21). Christians especially should not be less decided in manifesting their faith and confidence in Him, who is both their Maker and Counsellor (Isa. ix. 6), by readily accepting, than by strictly conforming to the hygienic maxims which He, who is wonderful in council, and excellent in working, has laid down for them in His Word ; which is thus clearly given in physical and physiological, as well as in moral, social, and spiritual matters, as a "lamp unto our feet and a light unto our path " (Psalm cxix. 105).



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